

***** QUERY RESULTS *****

=> d his 140

(FILE 'WPIX' ENTERED AT 15:11:30 ON 28 OCT 2009)

L40 14 S L38 OR L39

=> d que 140

L8 18364 SEA FILE=HCAPLUS ABB=ON PLU=ON ((SELF(W)ASSEMBL?)(W)
(MONOLAYER# OR MONO(W)LAYER#))

L9 14707 SEA FILE=HCAPLUS ABB=ON PLU=ON "SAM"

L10 1828847 SEA FILE=HCAPLUS ABB=ON PLU=ON PHENYL OR BIPHENYL OR
TERPHENYL

L11 70335 SEA FILE=HCAPLUS ABB=ON PLU=ON ANTHRACYL OR NAPHTHYL OR
BIPYRIDYL OR TERPYRIDYL

L12 6620 SEA FILE=HCAPLUS ABB=ON PLU=ON THIOPHENYL OR BITHIENYL OR
TERTHIENYL OR PYRROLYL

L13 12 SEA FILE=HCAPLUS ABB=ON PLU=ON (BI OR TRI)(W) CYCLOALKANE#
OR TETRA(W)CYCLOALKANE#

L34 258 SEA FILE=WPIX ABB=ON PLU=ON (L8 OR L9) AND ((L10 OR L11 OR
L12 OR L13))

L35 14 SEA FILE=WPIX ABB=ON PLU=ON L34 AND LITHOGRAPH?

L36 37 SEA FILE=WPIX ABB=ON PLU=ON L34 AND (SURFAC?) (2A) (TRANSIT?
OR MODIF? OR PATTERN?)

L37 8 SEA FILE=WPIX ABB=ON PLU=ON L36 AND LITHOGRAPH?

L38 14 SEA FILE=WPIX ABB=ON PLU=ON L35 OR L37

L39 6 SEA FILE=WPIX ABB=ON PLU=ON L38 AND (ARYL OR HETERO(W)ARYL
OR ALICYCLIC OR HETERO(W)CYCLIC)

L40 14 SEA FILE=WPIX ABB=ON PLU=ON L38 OR L39

=> d 140 1-14 iall abeq tech abex

L40 ANSWER 1 OF 14 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN

ACCESSION NUMBER: 2008-M49260 [73] WPIX

DOC. NO. CPI: C2008-385367 [73]

DOC. NO. NON-CPI: N2008-919671 [73]

TITLE: Production of nanocomposite film used, e.g. for optical
device, photovoltaic cell, or sensor protection device,
by co-depositing surface polymerizing organic
monomers/oligomers and gaseous lead salt clusters on
polymer film

DERWENT CLASS: A26; A89; L03; U11; U12

INVENTOR: ASUNSKIS D J; BOLOTIN I L; HANLEY L; WROBLE A T; ZACHARY
A M

PATENT ASSIGNEE: (UNII-C) UNIV ILLINOIS FOUND

COUNTRY COUNT: 120

PATENT INFORMATION:

PATENT NO	KIND DATE	WEEK	LA PG	MAIN IPC
WO 2008108809	A2	20080912 (200873)*	EN 54[10]	
WO 2008108809	A3	20090416 (200926)	EN	

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2008108809	A2	WO 2007-US19894	20070912
WO 2008108809	A3	WO 2007-US19894	20070912

PRIORITY APPLN. INFO: US 2006-843996P 20060912
US 2006-843996P 20060912

INT. PATENT CLASSIF.:

IPC ORIGINAL: C23C0014-06 [I,C]; C23C0014-06 [I,A]; C23C0014-06 [I,C];
C23C0014-32 [I,C]; C23C0014-32 [I,A]; C23C0014-32 [I,C]
ECLA: C23C0014-06; C23C0014-22

BASIC ABSTRACT:

WO 2008108809 A2 UPAB: 20090430

NOVELTY - Production of a nanocomposite film comprises co-depositing surface polymerizing organic monomers/oligomers and gaseous lead salt clusters on a polymer film.

USE - Method for the production of a nanocomposite film used, e.g. for an optical device, a photovoltaic cell (claimed), or a sensor protection device.

ADVANTAGE - Gaseous deposition allows direct control over nanocrystal size and density, improves flexibility in the choice of organic phase, and is compatible with lithographic methods.

DESCRIPTION OF DRAWINGS - The drawing is a schematic view of an arrangement for producing nanocomposite films. MANUAL CODE: CPI: A11-B05; A12-E11B; A12-L02A; A12-W14; L03-B05K1

EPI: U11-C01J5; U11-C13; U12-A02A1; U12-A02A4B

TECH

CERAMICS AND GLASS - Preferred Material: The substrate comprises a ceramic material.

INORGANIC CHEMISTRY - Preferred Material: The substrate comprises a metal, a semiconductor, or a nanotube. The lead salt clusters comprise lead sulfides, lead selenide, and/or lead telluride.

ORGANIC CHEMISTRY - Preferred Component: The organic ions comprise H⁺, H2S⁺, SO3⁺, C2Hx⁺, C4H4S⁺, C6H6⁺, C6H7N⁺, C5H5N⁺, and/or C4H4O⁺. The organic ions comprise thiophene.

POLYMERS - Preferred Method: The polymeric film is prepared by co-depositing organic ions and neutral oligomers on a substrate. Preferred Component: The neutral oligomer comprises terthiophene, sexithiophene, ethylenedioxythiophene, terphenyl, quaterphenyl, sexiphenyl, poly(phenylene vinylenes), porphyrins, phthalocyanines, pentacene, and/or diphenyl perylene. The neutral oligomer comprises an oligomer of thiophene including bithiophene, terthiophene, quarterthiophene, pentathiophene, hexathiophene, septathiophene, and/or octathiophene. Preferred Material: The substrate comprises a plastic, polymer, or a self-assembled monolayer.

L40 ANSWER 2 OF 14 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN

ACCESSION NUMBER: 2008-K90834 [64] WPIX

DOC. NO. CPI: C2008-316110 [64]

DOC. NO. NON-CPI: N2008-797650 [64]

TITLE: Substrate useful in electroluminescent device for forming pattern of nanocrystals comprises inorganic layer with modified surface of bifunctional molecule having affinity for nanocrystals and surface of inorganic layer at opposite ends

DERWENT CLASS: A85; E19; L03; P42; P73; T04; U11; U14

INVENTOR: CHO G T; CHO K S; CHOI J Y; CHOI S J; JUNG D Y; LEE J H; SHIN H J; SONG I Y; YI D K; YOON S M; DONG K Y; DUK Y J; HYEON J S; IN Y S; IN Z; JAE Y C; JONG H L; KEUN T C; KYUNG S C; SAI S; SEON M Y; SEONG J C

PATENT ASSIGNEE: (SMSU-C) SAMSUNG ELECTRONICS CO LTD

COUNTRY COUNT: 3

PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
US 20080182072	A1	20080731	(200864)*	EN	16	[10]
JP 2008183702	A	20080814	(200864)	JA	23	
KR 825176	B1	20080424	(200924)	KO		

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
US 20080182072	A1	US 2007-757018	20070601
JP 2008183702	A	JP 2007-274254	20071022
KR 825176	B1	KR 2007-8357	20070126

PRIORITY APPLN. INFO: KR 2007-8357

20070126

INT. PATENT CLASSIF.:

IPC ORIGINAL:

B05D0005-00 [I,A]; B05D0005-00 [I,C]; B29C0059-02 [I,A];
 B29C0059-02 [I,C]; B32B0003-02 [I,A]; B32B0003-02 [I,C];
 B32B0003-14 [I,A]; B32B0003-14 [I,C]; B82B0001-00 [I,A];
 B82B0001-00 [I,C]; B82B0003-00 [I,A]; B82B0003-00 [I,C];
 H01L0021-02 [I,C]; H01L0021-02 [I,C]; H01L0021-027 [I,A];
 H01L0021-20 [I,A]

USCLASS NCLM:

428/148.000

NCLS:

427/180.000; 428/156.000

JAP. PATENT CLASSIF.:

MAIN/SEC.:

B29C0059-02 B; B82B0001-00; B82B0003-00; H01L0021-30 502
 D

MAIN:

B82B0003-00

SECONDARY:

B29C0059-02 B; B82B0001-00; H01L0021-30 502 D

FTERM CLASSIF.:

3C082; 4F209; 5F046; 5F046/AA17; 5F046/AA28; 4F209/AD08;
 4F209/AF01; 4F209/AG05; 4F209/AJ03; 4F209/AJ06;
 4F209/AJ08; 4F209/AJ09; 4F209/PA02; 4F209/PB01;
 4F209/PN06; 4F209/PN09; 4F209/PQ11

BASIC ABSTRACT:

US 20080182072 A1 UPAB: 20090423

NOVELTY - A substrate (S1) for forming a pattern comprises an inorganic layer having a modified surface, where the modified surface is formed by coating a surface of the inorganic layer with a bifunctional molecule comprising a functional group that has an affinity for a nanocrystal at one end of the molecule and a functional group that has an affinity for the surface of the inorganic layer at the other end of the molecule.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(1) an electroluminescent device (D1) comprising the substrate (S1) and a nanocrystal light-emitting layer (440); and

(2) forming (M1) a nanocrystal pattern involving contacting a stamp comprising a nano-scale concavo-convex pattern formed on it that comprises a nanocrystal-coated surface against a substrate having an inorganic layer formed on it; and transferring and forming a nanocrystal pattern on the substrate (S1).

USE - In an electroluminescent (EL) device i.e. inorganic EL device or an organic EL device useful for forming pattern of nanocrystals; as light-emitting materials for light-emitting layers of various devices such as electroluminescent devices, display devices (claimed), backlight units (BLU) and nano-bio devices; in an ink-jet printing, self-assembly method, nanoimprinting lithography technique and semiconductor industry; as a promising ultra-fine patterning technique useful in nano-devices.

ADVANTAGE - The substrate utilizes the stable pattern of nanocrystals exhibiting quantum confinement effects and demonstrates electrical, magnetic,

optical, chemical and mechanical properties; have high luminescence efficiency and a small half bandwidth within the photoluminescence spectrum; ensures the efficient transfer high-resolution fine patterns through a low-cost and simple process in an effective manner that improves reliability of the nanocrystal thin film.

DESCRIPTION OF DRAWINGS - The figure shows an exemplary schematic process view of the fabrication of an electroluminescent device using the nanocrystal patterning method.

Anode (410)

Electron transport layer (420)

Surface-modified layer (430)

Nanocrystal light-emitting layer (440)

Hole transport layer. (450) MANUAL CODE:

CPI: A11-B05D; A11-

C04B1; A11-C04B2; A12-E11; A12-E11C;

A12-L02B2; A12-W14; E05-E02D; E05-E03B; E05-G03;

E10-A15F; E10-B01A4; E10-B01C1; E10-B01C3; E10-B01D;

E10-B01E; E10-B02E; E10-B03B2; E10-C02D2; E10-C04;

E10-D03D; E10-E03H; E10-E03M; E31-D04; E31-G; E31-H05;

E31-K07; E31-L; E31-P03; E31-P05A; E31-P06D; E34-C02;

E34-E01; E35; L03-G05; L03-G05F; L04-C06

EPI: T04-G02J; U11-C04J; U11-C05E; U14-J02D1

TECH

INORGANIC CHEMISTRY - Preferred Substrate: The substrate (S1) is a glass substrate, silicon substrate or plastic substrate, and is coated with an electrically conductive material. Preferred Components: The inorganic layer is formed of a material selected from metal oxides and/or metal nitrides. The metal oxide selected from titanium dioxide, zinc oxide, silicon dioxide, tin dioxide, tungsten trioxide, tantalum trioxide, barium titanate, barium zirconate, zirconium dioxide, hafnium dioxide, aluminum trioxide, yttrium trioxide, and zirconium orthosilicate. The metal nitride is silicon nitride and/or at least one metal oxide. In device (D1), the nanocrystal light-emitting layer comprises nanocrystals selected from metal nanocrystals containing gold, silver, platinum, palladium, cobalt, copper, molybdenum and/or their alloys; Group II-VI compound semiconductor nanocrystals containing cadmium sulfate, cadmium selenite, cadmium tellurite, zinc sulfate, zinc selenite, zinc tellurite, mercury sulfate, mercury selenite, mercury tellurite and/or their alloys; Group III-V compound semiconductor nanocrystals containing gallium nitrate, gallium phosphate, gallium arsenate, indium phosphate, indium arsenate and/or their alloys; and lead sulfate, lead selenite, lead tellurite and/or their alloys. Preferred Method: The method (M1) further involves preparing a stamp having a pattern corresponding to a nanocrystal pattern formed on the substrate (S1); coating nanocrystals on a surface of the patterned stamp to form a nanocrystal thin film; surface-treating an inorganic layer on the substrate (S1) with a bifunctional molecule to form a surface treated substrate; and contacting the stamp to the surface-treated substrate to transfer the nanocrystal pattern. In method (M1), the nanocrystal coating is carried out by spin coating, dip coating, spray coating, or blade coating. The bifunctional molecule treatment is carried out at 1-15 degrees C for 10 minutes to 1 hour using a solution (0.001-10 wt.%) obtained by dissolving the bifunctional molecules in a solvent selected from water, an organic solvent and a mixture of water and solvent. The bifunctional molecule treatment is application of the solution using a wet coating method selected from spin coating, dip coating, spray coating, a dispensing or sol-gel method, printing and casting, or a vapor-phase coating method selected from chemical vapor deposition (CVD) and vacuum deposition.

ORGANIC CHEMISTRY - Preferred Components: The bifunctional molecule is a compound capable of forming a self-assembled monolayer and is of formula Al-X-B1 (I). The bifunctional molecule

is selected from 2-carboxyethylphosphonic acid, mercaptoacetic acid, mercaptohexanol, and cysteamine. In method (M1), the stamp is formed of a material selected from polydimethylsiloxane, polyimide and polymethylmethacrylate. The organic solvent is selected from pyridine, ethanol, propanol, butanol, pentanol, hexanol, toluene, chloroform, chlorobenzene, tetrahydrofuran, cyclohexane, cyclohexene, methylene chloride, pentane, hexane, heptane, octane, nonane, decane and/or undecane.

Al=functional group selected from acetyl, acetic acid, phosphine, phosphonic acid, alcohol, vinyl, amide, phenyl, amine, acrylic, silane, cyano, and thiol;

X=1-20C linear or branched carbon chain or siloxane chain; and

B1=functional group selected from carboxylic acid, amine, phosphine, phosphonic acid and thiol.

ABEX EXAMPLE - Sylgard 184 (RTM: silicone elastomer base) and a curing agent were mixed at a weight ratio of 10:1 and stirred for 5 minutes. Bubbles were removed using a vacuum pump and the mixture was dropped on a wafer. Then, the wafer was cured in an oven at 80 degrees C for 1 hour and removed to prepare a polydimethylsiloxane (PDMS) stamp. A dispersion of cadmium selenite (CdSe)/zinc sulfate (ZnS) nanoparticles in hexane (1 wt.%) was dropped on the PDMS stamp, washed with isopropyl alcohol and spin-coated at 4000 rate per minutes for 20 seconds to form a nanocrystal thin film on the PDMS stamp. An indium tin oxide-patterned glass substrate was sequentially washed with a neutral detergent, deionized water, water and isopropyl alcohol and subjected to ultra-violet-ozone treatment. The percentage of isopropyl alcohol was 99 wt.%. The ultra-violet treatment was performed for 10 minutes. Then, the prepared substrate was placed in a solution of 2-carboxyethylphosphonic acid for 2 hours, and the solution was sufficiently adsorbed by the substrate. The substrate was washed with ethanol and subjected to heat treatment at 100 degrees C for 10 minutes. The resulting CdSe/ZnS nanoparticle-arranged stamp was in contact with the surface-treated substrate for 30 seconds, detached, and then subjected to heat treatment at 100 degrees C for 5 minutes to prepare a nanocrystal-patterned substrate (test). A control nanocrystal-patterned substrate was prepared in the same manner as that of the test nanocrystal-patterned substrate except that the surface of an inorganic layer was not subjected to surface treatment. The test/control substrates were evaluated for luminescence intensity. The test/control substrates showed luminescence intensity of approximately 0.7/0.25 au.

L40 ANSWER 3 OF 14 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN

ACCESSION NUMBER: 2007-445316 [43] WPIX

DOC. NO. CPI: C2007-161851 [43]

DOC. NO. NON-CPI: N2007-335970 [43]

TITLE: Patterning molecules, e.g. proteins, on substrate useful in sensor involves using a micro-contact printing process, where patterned molecules are kept in solvent or are covered by solvent during entire micro-contact printing process

DERWENT CLASS: A89; A97; B04; D16; P42; P75

INVENTOR: KRON G; MAYER D; OFFENHAEUSSER A; SCHWAAB D; WESSELS J; YASUDA A

PATENT ASSIGNEE: (KERJ-C) FORSCHUNGSZENTRUM JUELICH GMBH; (SONY-C) SONY DEUT GMBH

COUNTRY COUNT: 38

PATENT INFORMATION:

PATENT NO	KIND DATE	WEEK	LA	PG	MAIN IPC
-----------	-----------	------	----	----	----------

US 20070098899	A1	20070503	(200743)*	EN	13[4]
EP 1782886	A1	20070509	(200743)	EN	
CN 1958301	A	20070509	(200760)	ZH	

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
US 20070098899	A1	US 2006-477655	20060630
EP 1782886	A1	EP 2005-23880	20051102
CN 1958301	A	CN 2006-10143605	20061102

PRIORITY APPLN. INFO: EP 2005-23880

20051102

INT. PATENT CLASSIF.:

IPC ORIGINAL:

B01J0019-00 [I,A]; B01J0019-00 [I,C]; B01L0011-00 [I,A];
 B01L0011-00 [I,C]; B05C0001-00 [I,A]; B05C0001-00 [I,C];
 B05D0001-28 [I,A]; B05D0001-28 [I,C]; B05D0005-00 [I,A];
 B05D0005-00 [I,C]; B41M0001-00 [I,A]; B41M0001-00 [I,C];
 B41M0003-00 [I,A]; B41M0003-00 [I,A]; B41M0003-00 [I,C];
 B41M0003-00 [I,C]; C12N0011-00 [I,A]; C12N0011-00 [I,C];
 C12N0015-09 [I,A]; C12N0015-09 [I,C]; C12Q0001-68 [I,A];
 C12Q0001-68 [I,C]; G01N0033-48 [I,A]; G01N0033-48 [I,C];
 B41M0003-00F; B81C0001-00C8; G03F0007-00A

ECLA:

ICO:

L01J0219:00C10B4; L01J0219:00C2D8; L01J0219:00C2L8;
 L01J0219:00C4L12; L01J0219:00C4L2; L01L0003:02D4;
 Y01N0004:00

USCLASS NCLM:

427/256.000

NCLS:

118/211.000; 427/429.000

BASIC ABSTRACT:

US 20070098899 A1 UPAB: 20080918

NOVELTY - Patterning (M1) molecules on a substrate involves using a micro-contact printing process, where the patterned molecules are kept in solvent or are covered by solvent during the entire micro-contact printing process.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(1) a substrate is produced by the method (M1) and comprising a pattern of molecules have retained their function and/or activity and/or native conformation;

(2) a device for performing the method (M1) comprising a first unit holding a solution of patterned molecules, patterned surface (preferably in the form of a stamp), substrate, kept in a solvent or covered by a solvent; a second unit to transfer the molecules is patterned form the first unit to the patterned surface; a third unit to transfer the patterned molecules from the patterned surface to the substrate; a fourth unit to ensure that the patterned molecules are kept in a solvent or covered by a solvent during the transfer from the first unit to the patterned surface to the substrate.

USE - For patterning molecules e.g. protein molecules, redox proteins, nucleic-acid binding proteins, enzymes, metallo-proteins, cytochrome c, azurin, cytoskeleton-proteins, antibodies, nucleic acids, deoxyribonucleic acid, ribonucleic acid, peptide nucleic acid, aptamers, lipids, phospholipids and sphingolipids on a substrate which is useful in a sensor, a bioreactor or for guiding cell growth (all claimed).

ADVANTAGE - The method allows to pattern biomolecules to dimensions down to 150 nm, while preserving their structural integrity and functionality by using an in-situ process; allows the immobilization and patterning of molecules on a substrate; is easy to perform even with biological macromolecules whilst maintaining their functionality; prevents drying or denaturation of the molecules. The molecules is patterned retain their function and/or activity and/or native conformation throughout the entire process, due to their kept in solvent or covered

by solvent during the entire micro-contact printing process. The patterned molecules are kept under physiological conditions such as pH and salinity, throughout the entire micro-contact printing process. The patterned molecules having a length of approximately 10 nm - 500microns (preferably 10 nm - 200 microns, especially approximately 10 nm - 150 microns).

MANUAL CODE: CPI: A12-L04; B04-B01B; B04-B04C; B04-C01; B04-E01; B04-E07F; B04-E10; B04-F01; B04-G01; B04-K01; B04-L01; B04-N04; B11-C08B; B12-K04; D05-A01A; D05-A01B; D05-H10; D05-H11

TECH

BIOTECHNOLOGY - Preferred Components: The substrate comprises a modified with molecular layers with antibodies for binding corresponding antigens, or modified with molecular layers with antigens for binding corresponding antibodies; or modified with molecular layers with receptors for specific binding of molecules (preferably gold modified with a mercapto undecanoic acid layer (MUA)).

IMAGING AND COMMUNICATION - Preferred Method: The method (M1) involves a) providing molecules to be patterned in a solvent and providing a patterned surface (preferably in the form of a stamp), b) transferring the molecules are patterned onto the patterned surface and immobilizing them whilst keeping the molecules in the solvent or covered by the solvent, c) providing a substrate and bringing the patterned surface having the molecules immobilized into conformal contact with the substrate thus creating a pattern of the molecules on the substrate, whilst keeping the molecules in the solvent or covered by the solvent. In the step a), the molecules are provided in the solvent and are first immobilized on an ink-pad (preferably in the form of a non-patterned surface), within the solvent. The molecules are provided in the solvent. In the step b), the ink-pad having the molecules immobilized is brought into conformal contact with the patterned surface in a first solvent environment containing the molecules is patterned, the solvent and, optionally, a buffer, thus transferring the molecules onto the patterned surface and immobilizing. The molecules are immobilized on the patterned surface within the solvent. The step b) occurs by immersing the patterned surface in the solvent. The ink-pad having the molecules immobilized is brought into conformal contact with the patterned surface in a second solvent environment containing the solvent and, optionally, a buffer, after transfer of the ink-pad having the molecules immobilized to the second solvent environment, thus transferring the molecules onto the patterned surface and immobilizing. In the step c), the substrate is provided in a second solvent environment containing the solvent and, optionally a buffer, and the patterned surface having the molecules immobilized, after step b), molecule is transferred to the second solvent environment and is brought into conformal contact with the substrate. The substrate is provided in a third solvent environment containing the solvent and, optionally, a buffer, and the patterned surface having the molecules immobilized, after step b), molecule is transferred to the third solvent environment and is brought into conformal contact with the substrate. The substrate is provided in a fourth solvent environment containing the solvent and, optionally, a buffer, and wherein the patterned surface having the molecules immobilized, after step b), molecule is transferred to the fourth solvent environment and is brought into conformal contact with the substrate. The substrate is provided without a solvent environment, and the patterned surface having the molecules immobilized is brought into conformal contact with the substrate whilst keeping the molecules covered by the solvent, and the patterned surface is transferred to a fifth solvent

environment containing the solvent and, optionally a buffer, whilst is in contact with the substrate, the transfer of the patterned surface and the substrate occurring immediately after the patterned surface is brought into conformal contact with the substrate, thus avoids a drying of the patterned surface on the substrate. The bringing into conformal contact of the patterned surface with the substrate of step c) occurs in a period of not greater than 180 (preferably not greater than 120, especially not greater than 1, particularly 1) minutes after immobilizing the molecules is patterned on the patterned surface. After step c), the patterned surface is lifted from the substrate, thereby leaving behind a substrate having a pattern of the molecules. The substrate having a pattern of molecules is kept in or covered by solvent optionally containing a buffer. The micro-contact printing process occurs in the absence of a drying step. Preferred Components: The ink-pad (preferably at least a surface of the ink-pad) is made from a material selected from the single-crystalline materials and polycrystalline materials (such as silicon, silicon oxide, layered composite systems, silicon oxide on silicon, metal layers on silicon/siliconoxide); amorphous materials (such as glass); plastics (such as elastomers, preferably polydimethylsiloxane, plastomers, polyolefines, polyolefinic plastomers), ionomers, resist materials, (such as ultraviolet-nanoimprint lithography-resists (UV-NIL-resists)). The second unit is an ink-pad (preferably a non-patterned surface).

INORGANIC CHEMISTRY - Preferred Components: The substrate comprises a spacer layer and/or a binding layer which facilitates binding of the substrate to the molecules is patterned through covalent binding, electrostatic forces, Vander Waals forces, H-bonding and/or London forces. The substrate is selected from the metals and semi metals, single or polycrystalline materials (preferably single or polycrystalline metals and semi metals, especially gold, platinum, silicon) or composite materials (preferably single or polycrystalline composites, especially siliconoxide, gallium arsenide) or amorphous composite materials (preferably glass). The patterned surface is made from a material selected from the single-crystalline materials and polycrystalline materials (such as silicon, silicon oxide, layered composite systems, silicon oxide on silicon, metal layers on silicon/siliconoxide); amorphous materials (such as glass); plastics (such as elastomers, preferably polydimethylsiloxane), plastomers (preferably polyolefines, especially polyolefinic plastomers), ionomers, resist materials (such as ultraviolet-nanoimprint lithography-resists (UV-NIL-resists)).

POLYMERS - Preferred Components: The substrate comprises a plastics (preferably elastomers, especially polydimethylsiloxane), plastomers (preferably polyolefines), ionomers (preferably resist materials, especially ultraviolet-nanoimprint lithography-resists (UV-NIL resists)); modified with molecular layers (preferably self assembling monolayers (SAMs), for direct binding or indirect binding; self assembling monolayers (SAMs) for indirect binding with one or multiple chemicals or treatments to achieve the binding site. **ORGANIC CHEMISTRY - Preferred Components:** The substrate comprises a self assembling monolayers (SAMs) with two termini such as one for attaching the molecule to the substrate such as a thiol-headgroup for binding on gold (preferably self assembling monolayers (SAMs) with a silane-headgroup terminus for binding on siliconoxide); the second terminus for coupling the ink, such as self assembling monolayers (SAMs) with mercapto- or amino-groups for binding metals, self assembling monolayers (

SAMs) with carboxy-groups for electrostatic binding, self assembling monolayers (SAMs) with mercapto-groups for binding metals with plain alkyl chains having methylene groups for van der Waals interaction, with -COOH, -OH or vinyl-groups for covalent coupling, self assembling monolayers (SAMs) with antibodies for binding corresponding antigens, self assembling monolayers (SAMs) with antigens for binding corresponding antibodies, self assembling monolayers (SAMs) with receptors for specific binding of molecules. The patterned molecules are protein molecules having one or several lysine residues, and the substrate is gold, preferably having a spacer layer on its surface to avoid denaturation of the protein, the spacer layer preferably having a thickness of 0.5 - 200 nm, on a substrate.

L40 ANSWER 4 OF 14 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN
 ACCESSION NUMBER: 2006-162430 [17] WPIX
 DOC. NO. CPI: C2006-054284 [17]
 DOC. NO. NON-CPI: N2006-140133 [17]
 TITLE: Photovoltaic cell comprises absorber; two substrates comprising respective conductive surfaces; electron transporter and hole transporter
 DERWENT CLASS: A18; A28; A85; E13; E24; L03; U12; X15
 INVENTOR: ALIZADEH A; CELLA J A; DUGGAL A R; GUI J Y; SPIVACK J L; YAKIMOV A
 PATENT ASSIGNEE: (ALIZ-I) ALIZADEH A; (CELL-I) CELLA J A; (DUGG-I) DUGGAL A R; (GENE-C) GENERAL ELECTRIC CO; (GUIJ-I) GUI J Y; (SPIV-I) SPIVACK J L; (YAKI-I) YAKIMOV A
 COUNTRY COUNT: 39

PATENT INFORMATION:

PATENT NO	KIND DATE	WEEK	LA	PG	MAIN IPC
US 20060021647	A1	20060202	(200617)*	EN	19[4]
EP 1630883	A2	20060301	(200617)	EN	
JP 2006049890	A	20060216	(200617)	JA	28
CN 1734792	A	20060215	(200639)	ZH	
CN 100539201	C	20090909	(200965)	ZH	

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
US 20060021647	A1	US 2004-900624	20040728
EP 1630883	A2	EP 2005-254258	20050707
JP 2006049890 A		JP 2005-216748	20050727
CN 1734792 A		CN 2005-10087971	20050728
CN 100539201 C		CN 2005-10087971	20050728

PRIORITY APPLN. INFO: US 2004-900624 20040728
 INT. PATENT CLASSIF.:

IPC ORIGINAL: H01G0009-20 [I,A]; H01G0009-20 [I,C]; H01L0021-00 [I,A]; H01L0021-00 [I,C]; H01L0031-00 [I,A]; H01L0031-00 [I,C]; H01L0031-04 [I,A]; H01L0031-04 [I,C]; H01L0051-00 [I,A]; H01L0051-00 [I,C]; H01L0051-00 [I,C]; H01L0051-42 [I,A]; H01L0051-42 [I,C]; H01M0014-00 [I,A]; H01M0014-00 [I,C]; H01G0009-20 [I,A]; H01G0009-20 [I,C]; H01L0031-04 [I,A]; H01L0031-04 [I,C]; H01M0014-00 [I,A]; H01M0014-00 [I,C]

ECLA: H01L0051-00T; H01L0051-42B; H01L0051-42F
 ICO: L82T0201:01T; T01L0051:00M12B; T01L0051:00M6F;
 T01L0051:00M6H; T01L0051:00M6H12B; Y01N0006:00
 USCLASS NCLM: 136/252.000
 NCLS: 136/256.000; 438/057.000
 JAP. PATENT CLASSIF.:
 MAIN/SEC.: H01L0031-04 D; H01M0014-00 P
 MAIN: H01L0031-04 D
 SECONDARY: H01M0014-00 P
 FTERM CLASSIF.: 5F051; 5H032; 5H032/AA06; 5F051/AA08; 5F051/AA09;
 5F051/AA11; 5F051/AA20; 5H032/AS16; 5H032/BB05;
 5H032/BB10; 5F051/CB11; 5H032/EE04; 5H032/EE16;
 5H032/EE18; 5F051/FA12; 5H032/HH07

BASIC ABSTRACT:

US 20060021647 A1 UPAB: 20060310

NOVELTY - A photovoltaic cell comprises an absorber to absorb electromagnetic radiation; two substrates comprising respective conductive surfaces; an electron transporter in electrical communication with the second conductive surface and is electrically insulated from first substrate; and a hole transporter that is in electrical communication with the first conductive surface and electrically insulated from the second substrate.

DETAILED DESCRIPTION - A photovoltaic cell comprises an absorber that can absorb electromagnetic radiation; a first substrate comprising a first conductive surface; a second substrate comprising a second conductive surface that is opposed to the first conductive surface and faces the first conductive surface of the first substrate; an electron transporter that is in electrical communication with the second conductive surface of the second substrate, but is electrically insulated from the first substrate; and a hole transporter that is in electrical communication with the first conductive surface of the first substrate, but is electrically insulated from the second substrate. The hole transporter and/or the electron transporter are chemically bonded to an electrically insulating sheath; and to the absorber. INDEPENDENT CLAIMS are included for the following:

(A) a photovoltaic cell comprising: a cylinder comprising a first intrinsically conducting polymer capable of transporting electrons to a second substrate; a matrix capable of conducting holes to a first substrate. The matrix is optically transparent and surrounds the cylinder, but is not in electrical communication with it; a sheathed layer disposed between the cylinder and the matrix and in intimate contact with the cylinder and the matrix. The sheathed layer comprises electrically insulating molecules and is at least 0.2 nanometer thick; an absorber chemically bonded to the first intrinsically conducting polymer and disposed between the cylinder and the matrix in a manner such that it is in electrical communication with the cylinder while being electrically insulated from the matrix. The absorber is capable of absorbing electromagnetic radiation of wavelengths of 300 - 1100 nanometers. The first and the second substrate are in electrical communication with one another;

(B) a photovoltaic composition comprising: the electron transporter optionally bonded to an electrically insulating molecule; the hole transporter optionally bonded to the electrically insulating molecule; and the absorber;

(C) a device comprising the composition;

(D) manufacturing a photovoltaic cell involving: blending a composition comprising an absorber that is capable of absorbing electromagnetic radiation; an electron transporter and/or a hole transporter; and/or an electrically insulating molecule; and depositing the composition upon a substrate.

USE - In photovoltaic cells as solar cells.

ADVANTAGE - The photovoltaic cells can provide an energy conversion efficiency of greater than or equal to 10 (preferably greater than or equal to 20, especially greater than or equal to 30)% and are versatile and flexible, have a light weight and can be manufactured by flexible methods such as using roll mills.

The photovoltaic cells have reduced charge transport distances and minimize or prevent recombinations and backreactions, and can be easily mass produced. MANUAL CODE: CPI: A04-H00H; A05-K00K; A12-E06; A12-E11B; E05-H; E05-U; E06-D13; E06-D15; E07-D13C; E07-E04; E08-H; E10-B01A4; E10-B04A2; E23-B; E25; E31-P06A; L04-E05D EPI: U12-A02A; X15-A02A

TECH

ELECTRONICS - Preferred Cell: The first substrate and/or the second substrate is transparent to light having a wavelength of 300 - 1100 nanometers. The conductive surface of the first substrate is in electrical communication with the conductive surface of the second substrate through an electrical circuit that is external to the photovoltaic cell. The conductive surfaces of the first and/or the second substrate comprise at least one layer of electrically conducting materials that can comprise metals, semiconductors, doped semiconductors and/or intrinsically conducting polymers. The electron transporter and hole transporter are in the form of interdigitated fingers that form an interpenetrating structure and are parallel to each other. The interdigitated fingers have a random configuration or have a characteristic dimension that is greater than or equal to 2 nanometers. The characteristic dimension is a layer thickness or a diameter and the interdigitated fingers and/or the insulating sheath have a cross-section that is substantially rectangular or circular. The electron transporter and the hole transporter are of a similar chemical composition and comprise intrinsically conductive polymers. The electron transporters are in the form of nano-structures. The nano-structures include nanowires, nano-rods, or nanosheets, and comprise metals, semiconductors and/or inherently conducting polymers. The electrically insulating sheath is bonded to the electron transporter and/or the hole transporter and prevents electrons from recombining with holes and the electrically insulating sheath has a characteristic dimension that is greater than or equal to 0.2 nanometers. The electrically insulating sheath can comprise a partial monolayer or multiple layers of electrically insulating material. The electrically insulating material can comprise non-conductive inorganic compounds, non-conjugated monomers, polymeric molecules, oligomeric molecules and/or nanoparticles. The first conductive surface is a patterned electrically conductive surface. The second conductive surface is a patterned electrically conductive surface. The absorber is disposed between the electron transporter and the hole transporter and is capable of absorbing electromagnetic radiation. The patterning of the second/first substrate permits electrical communication with the electron transporter/the hole transporter respectively, while prohibiting electrical communication with the hole transporter/the electron transporter. The patterned electrically conductive surface comprise nanowires. The electron transporter and the hole transporter self assemble into structures that have a lamellar, cylindrical, bicontinuous or interpenetrating morphology. The photovoltaic cell further comprises the electrically insulating sheath that is disposed between the electron transporter and the hole transporter; and electrically insulating sheath minimizes electron transport from the electron transporter to the hole transporter. The absorber resides in an interface between the electron transporter and the hole transporter. In the composition, the electron transporter and/or the hole transporter comprises the intrinsically conducting polymer. The electrically insulating molecules comprise non-conductive inorganic oxides and/or non-conjugated organic molecules. The electron transporter is in the form of a nanowire that comprises an oxide of titanium. Preferred Method: The photovoltaic cell is manufactured by a process involving self assembly of the electron transporter and the hole transporter. The self assembly is accomplished by using templates, masks, electrical fields, magnetic

fields, shear fields, and/or hydrophobic-hydrophilic interactions. The patterned electrically conductive surface is chemically bonded to the electron transporter or the hole transporter through a self assembled monolayer or a polymer brush. The patterned electrically conductive surface is patterned by using e-beam lithography, nano-imprinting, extreme UV lithography, and/or block copolymer lithography. The blending involves solution blending and/or melt blending. The method further involves reacting the absorbing molecule with the electron transporter and/or the hole transporter, or reacting the absorber and/or the electron transporter and/or the hole transporter with the insulating molecule. The depositing the composition on a substrate facilitates a self-assembly into cylinders that comprise the electron transporters surrounded by a matrix that comprises the hole transporters. The self-assembly promotes the electron transporters to be in electrical communication with a conductive surface of one substrate, while the hole transporters are in electrical communication with a conductive surface of another substrate; promotes an absorber to be disposed on an outer surface of the electron transporter and/or the hole transporter; or promotes a sheathed layer to be disposed on an outer surface of the electron transporter and/or the hole transporter.

ORGANIC CHEMISTRY - Preferred Components: The hole transporter and/or the electron transporter comprise hydrazone compounds, styryl compounds, diamine compounds, aromatic tertiary amine compounds, butadiene compounds, indole compounds, carbazole derivatives, triazole derivatives, imidazole derivatives, oxadiazole derivatives having an amino group, triphenylmethane, bis(4-diethylamine-2-methylphenyl) phenylmethane, styrene, hydrozone; aromatic amines comprising tritolylamine; arylamine; enamine phenanthrene diamine; N,N'-bis-(3,4-dimethylphenyl)-4-biphenyl amine; N,N'-bis-(4-methylphenyl)-N,N'-bis(4-ethylphenyl)-1,1'-3,3'-dimethylbiphenyl)-4,4'-diamine; 4,4'-bis(diethylamino)-2,2'-dimethyltriphenylmethane; N,N'-diphenyl-N,N'-bis(3-methylphenyl)-(1,1'-biphenyl)-4,4'-diamine; N,N'-diphenyl-N,N'-bis(4-methylphenyl)-1,1'-biphenyl-4,4'-diamine; N,N'-diphenyl-N,N'-bis(alkylphenyl)-1,1'-biphenyl-4,4'-diamine; or N,N'-diphenyl-N,N'-bis(chlorophenyl)-1,1'-biphenyl-4,4'-diamine; 1,1-bis(4-di-para-tolylaminophenyl)cyclohexane; 1,1-bis(4-di-p-tolylaminophenyl)-4-phenylcyclohexane; 4,4'-bis(diphenylamino)quadruphenyl; bis(4-dimethylamino-2-methylphenyl)-phenylmethane; N,N,N'-Tri(para-tolyl)amine; 4-(di-para-tolylamino)-4'-(4(di-para-tolylamino)-styryl) stilbene; N,N,N',N'-tetra-para-tolyl-4,4'-diaminobiphenyl; N,N,N',N'-tetraphenyl-4,4'-diaminobiphenyl; N,N,N',N'-tetra-1-naphthyl-4,4'-diaminobiphenyl; N,N,N',N'-tetra-2-naphthyl-4,4'-diaminobiphenyl; N-phenylcarbazole; 4,4'-bis(N-(1-naphthyl)-N-phenylamino)biphenyl; 4,4'-bis(N-(1-naphthyl)-N-(2-naphthyl)amino)biphenyl; 4,4'-bis(N-(1-naphthyl)-N-phenylamino)para-terphenyl; 4,4'-bis(N-(2-naphthyl)-N-phenylamino)biphenyl; 4,4'-bis(N-(3-acenaphthenyl)-N-phenylamino)biphenyl; 1,5-bis(N-(1-naphthyl)-N-phenylamino)naphthalene; 4,4'-bis(N-(9-anthryl)-N-phenylamino)biphenyl; 4,4'-bis(N-(1-anthryl)-N-phenylamino)-para-terphenyl; 4,4'-bis(N-(2-phenanthryl)-N-phenylamino)biphenyl; 4,4'-bis(N-(8-fluoranthryl)-N-phenylamino)biphenyl; 4,4'-bis(N-(2-pyrenyl)-N-phenylamino)biphenyl; 4,4'-bis(N-(2-naphthacetyl)-N-phenylamino)biphenyl; 4,4'-bis(N-(2-perylene)-N-phenylamino)biphenyl;

4,4'-bis(N-(1-coronyl)-N-phenylamino)biphenyl;
 2,6-bis(di-para-tolylamino)-naphthalene; 2,6-bis(di-(1-naphthyl
 amino)naphthalene; 2,6-bis(N-(1-naphthyl)-N-(2-naphthyl
 amino)naphthalene; N,N,N',N'-tetra(2-naphthyl
)-4,4'-diamino-para-terphenyl; 4,4'-bis(N-phenyl
 -N-(4-(1-naphthyl)-phenyl)amino) biphenyl;
 4,4'-bis(N-phenyl-N-(2-pyrenyl)amino)biphenyl;
 2,6-bis(N,N-di(2-naphthyl)-amine)fluorine; and/or 1,5-bis(N-(1-
 naphthyl)-N-phenylamino)naphthalene. The electron transporters are
 functionalized fullerenes, 6,6-phenyl-61C-butyl
 acid-methylester, difluorovinyl-(hetero)arylenes,
 3-(1,1-difluoro-alkyl)thiophene group, pentacene, poly(3-hexylthiophene),
 alpha,omega-substituted sexithiophenes,
 n-decapentafluoroheptyl-methyl-naphthalene-1,4,5,8-tetracarboxylic diimide,
 dihexyl-quinqueithiophene, poly(3-hexylthiophene), poly(3-alkylthiophene),
 di-hexyl-hexathiophene, dihexyl-anthradithiophene-, phthalocyanine and/or
 60C fullerene. The absorber comprises an absorbing molecule and a charge
 separator that is chemically bonded to the absorbing molecule. The
 absorbing molecule comprises at least one long wavelength absorbing
 molecule and at least one short wavelength absorbing molecule capable of
 absorbing electromagnetic radiation of wavelengths of 700 - 1100 and 300 -
 700 nanometers respectively. The short wavelength absorbing molecule and
 the long wavelength absorbing molecule are chemically compatible with one
 another and can reside in a single phase. The charge separator is a
 substituted phenothiazine moiety, a substituted carbazole moiety, and/or a
 substituted dibenzochalcophene moiety and comprises an electron donating
 moiety and/or a reducing agent. The absorber displays a push-pull
 capability and the push-pull capability enables an ejected electron to
 move towards the electron transporter rather than towards the hole
 transporter. The absorber has a lowest unoccupied molecular orbital (LUMO)
 level to eject an electron directly into the conduction band of the
 electron transporter, and a highest occupied molecular orbital (HOMO)
 level effective to eject a hole directly into the hole conduction band of
 the hole transporter. The matrix is a liquid electrolyte, ionic liquid,
 inorganic or organic hole conducting compound. The ionic liquid is
 methylpropylimidazolium triflate, methylpropylimidazolium bistriflimide;
 methylpropylimidazolium nanoflate, methylpropylimidazolium ethersulfonate,
 methylpropylimidazolium iodide, methylpropylimidazolium triiodide,
 methylpropylimidazolium pseudo-halides and/or metal complex cations with a
 phosphonium anion. In the composition, the absorbing molecules are dyes
 and/or pigments. The dyes and/or pigments are anthranones; anthraquinones;
 croconines; azos; benzimidazolones; diketo pyrrole pyrroles; dioxazines;
 diarylides; indanthrones; isoindolines; isoindolinones; naphthols;
 perinones; perylenes; ansanthrones; dibenzpyrenequinones; pyranthrone;
 bianthrone; isobioranthrone or their respective derivatives;
 diphenylmethane and triphenylmethane pigments; cyanine and azomethine
 pigments; indigoid pigments; bisbenzimidazole pigments; azulenium salts;
 pyrylium salts; thiapyrylium salts; benzopyrylium salts; phthalocyanines,
 pyranthrone or their derivatives; quinacridones; quinophthalones;
 squaraines and/or squariliums or their respective derivatives. The azos
 and their derivatives comprise monoazos, diazos, trisazos or their
 derivatives. The azos comprise azo pigments having a triphenylamine
 structure, a carbazole structure, a fluorene structure, an oxadiazole
 structure, a bisstilbene structure, a dibenzothiophene structure, a
 distyrylbenzene structure, a distyrylcarbazole structure,
 distyryloxadiazole structure, an anthraquinone structure or a stilbene
 structure; trisazo pigments having a carbazole structure; and/or bisazo
 pigments having a diphenylpolyene structure. The electron transporter/the
 hole transporter comprises reactive groups that only permit chemical
 bonding with the second substrate/the first substrate respectively.

POLYMERS - Preferred Components: The intrinsically conducting polymers are poly(acetylene) and its derivatives; poly(thiophenes) and its derivatives; poly(3,4-ethylenedioxythiophene) and poly(3,4-ethylenedithiathienophene) and their derivatives; poly(isathianaphthene), poly(pyrindiothiophene), poly(pyrizinothiophene), and their derivatives; poly(pyrrole) and its derivatives; poly(3,4-ethylenedioxyppyrrrole) and its derivatives; poly(aniline) and its derivatives; poly(phenylenevinylene) and its derivatives; poly(p-phenylene) and its derivatives; poly(thionaphthene), poly(benzofuran), and poly(indole) and their derivatives; poly(dibenzothiophene), poly(dibenzofuran), poly(carbazole) and their derivatives; poly(bithiophene), poly(bifuran), poly(bipyrrole), and their derivatives; poly(thienothiophene), poly(thienofuran), poly(thienopyrrole), poly(furanylpyrrole), poly(furanylfuran), poly(pyrrolylpyrrole), and their derivatives; poly(terthiophene), poly(terfuran), poly(terpyrrole), and their derivatives; poly(dithienothiophene), poly(difuranylthiophene), poly(dipyrrolylthiophene), poly(dithienofuran), poly(dipyrrolylfuran), poly(dipyrrolylpyrrole) and their derivatives; poly(phenyl acetylene) and its derivatives; poly(biindole) and derivatives; poly(dithienovinylene), poly(difuranylvinylene), poly(dipyrrolylvinylene) and their derivatives; poly(1,2-trans(3,4-ethylenedioxythienyl)vinylene), poly(1,2-trans(3,4-ethylenedioxyfuranyl)vinylene), poly(1,2-trans(3,4-ethylenedioxyppyrryl)vinylene), and their derivatives; poly(bis-thienylarylenes) and poly(bis-pyrrolylarylenes) and their derivatives; poly(dithienylcyclopentenone); poly(quinoline); poly(thiazole); poly(fluorene); and/or poly(azulene). The oligomeric molecules or polymeric molecules are polyacetals, polyurethanes, polylefins, polyacrylics, polycarbonates, polyalkyds, polystyrenes, polyesters, polyamides, polyaramides, polyamideimides, polyarylates, polyarylsulfones, polyethersulfones, polyphenylene sulfides, polysulfones, polyimides, polyetherimides, polytetrafluoroethylenes, polyetherketones, polyether etherketones, polyether ketone ketones, polybenzoxazoles, polyoxadiazoles, polybenzothiazinophenothiazines, polybenzothiazoles, polypyrazinoquinoxalines, polypyromellitimides, polyquinoxalines, polybenzimidazoles, polyoxindoles, polyoxoisindolines, polydioxoisindolines, polytriazines, polypyridazines, polypiperazines, polypyridines, polypiperidines, polytriazoles, polypyrazoles, polycarbonates, polyoxabicyclononanes, polydibenzofurans, polyphthalides, polyacetals, polyanhydrides, polyvinyl ethers, polyvinyl thioethers, polyvinyl alcohols, polyvinyl ketones, polyvinyl halides, polyvinyl nitriles, polyvinyl esters, polysulfonates, polysulfides, polythioesters, polysulfones, polysulfonamides, polyureas, polyphosphazenes, and/or polysilazanes. The electron transporter, the hole transporter or the absorber are present in the form of a block copolymer. The matrix comprises a second intrinsically conducting polymer that is not chemically similar to the first intrinsically conducting polymer, which that is used as the electron transporter.

L40 ANSWER 5 OF 14	WPIX COPYRIGHT 2009	THOMSON REUTERS on STN
ACCESSION NUMBER:	2005-758275 [77]	WPIX
DOC. NO. CPI:	C2005-231332 [77]	
DOC. NO. NON-CPI:	N2005-625761 [77]	
TITLE:	Stabilized system as resists for nanofabrication, includes stabilizing solution of solvent and stabilizing component that contains molecules with solvent-philic and surface layer-philic portions	
DERWENT CLASS:	A85; L03; P73; U11	
INVENTOR:	AMRO N A; LIU G; YANG G	
PATENT ASSIGNEE:	(AMRO-I) AMRO N A; (LIUG-I) LIU G; (REGC-C) UNIV CALIFORNIA; (UYWA-N) UNIV WAYNE STATE; (YANG-I) YANG G	

COUNTRY COUNT: 107

PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
WO 2005089415	A2	20050929	(200577)*	EN	74[13]	
US 20050221081	A1	20051006	(200577)	EN		
WO 2005089415	A3	20090423	(200929)	EN		

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2005089415 A2		WO 2005-US8850	20050317
US 20050221081 A1	Provisional	US 2004-555770P	20040323
US 20050221081 A1		US 2005-83739	20050317
WO 2005089415 A3		WO 2005-US8850	20050317

PRIORITY APPLN. INFO: US 2004-555770P 20040323
 US 2005-83739 20050317
 US 2004-555770P 20040323

INT. PATENT CLASSIF.:

IPC ORIGINAL: B05D0001-00 [I,A]; B05D0001-00 [I,C]; B05D0001-18 [N,A];
 B05D0001-18 [N,C]; B05D0001-36 [N,A]; B05D0001-36 [N,C];
 B32B0015-04 [I,A]; B32B0015-04 [I,C]

IPC RECLASSIF.: B05D0001-18 [I,A]; B05D0001-18 [I,C]; B05D0003-10 [N,A];
 B05D0003-10 [N,C]; B32B0015-04 [I,A]; B32B0015-04 [I,C];
 G01N0033-543 [I,A]; G01N0033-543 [I,C]

ECLA: B05D0001-18C; G01N0033-543M
 ICO: L05D0001:18C; L05D0003:10L; L82T0201:01; Y01N0006:00
 USCLASS NCLM: 428/338.000
 NCLS: 428/420.000; 428/457.000

BASIC ABSTRACT:

WO 2005089415 A2 UPAB: 20090509

NOVELTY - Stabilized system comprises a solid support, a surface-layer bonded to a portion of a surface of the solid support, and a stabilizing solution contacted with a portion of the surface-layer. The stabilizing solution comprises a solvent and a stabilizing component, which contains molecules having a solvent-philic portion and a surface layer-philic portion.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

- (1) stabilized surface-layer comprising self-assembled monolayer and stabilizing solution contacting a portion of the self-assembled monolayer;
- (2) kit for use in stabilizing a system comprising the stabilizing solution and instructions for contacting the stabilizing solution with a surface-layer bonded to a solid support surface; and
- (3) method for stabilizing the surface-layer bonded to a surface portion of the solid support comprising contacting the surface-layer with a fluid having the stabilizing component containing molecules that associate preferentially with defect sites in the surface-layer.

Each molecule of the self-assembled monolayer contains 1-30C alkyl linker, a head group bonded to a surface portion of a solid support and terminal group(s). The stabilizing solution comprises water and a stabilizing component containing amphiphilic molecules.

USE - For use as resists for nanofabrication.

ADVANTAGE - The inventive system is capable of preventing the degradation of the surface-layer bonded to the solid support. The protected layer formed at defects sites lowers the free energy of adsorbed surface layers and increases the activation energy to inhibit degradation pathways.

MANUAL CODE: CPI: A12-E01; L04-C05

TECH

BIO TECHNOLOGY - Preferred Component: The pre-engineered surface layer includes biomolecule(s) of antibodies, oligonucleotides, DNA, RNA, oligopeptides, peptides, and/or proteins.

CERAMICS AND GLASS - Preferred Component: The metal thin film of the solid support can be mica surface, glass surface, or quartz surface.

ELECTRONICS - Preferred Component: The surface portion of the solid support can be semiconductor surface, or insulator surface. A portion of the surface-layer is a monolayer, a multilayer, or a thin film. The monolayer is a self-assembled monolayer. The

surface of the solid support is immersed in the stabilizing solution. The stabilizing component contains molecules that associate preferentially with defect sites in the surface-layer. The defect sites are domain boundaries, holes, pits, cracks, dislocations, island edges, and/or step edges. The solid support comprises a pre-engineered surface layer having microstructures, and/or nanostructures surrounded by a self-assembled monolayer, multilayer, or thin film. The microstructures are prepared by microcontact printing, photolithography, micromachining, and/or soft lithography. The nanostructures are prepared by nanografting, scanning probe lithography, mixing of multicomponents, e-beam lithography, and/or atom lithography.

INORGANIC CHEMISTRY - Preferred Material: The surface portion of the solid support is a metal surface, metal thin film, or preferably gold, silver, platinum, palladium or copper surface. The solid support comprises a metal (preferably gold) thin film on a silicon wafer surface. The solvent is water.

ORGANIC CHEMISTRY - Preferred Material: The surface portion of the solid support is a metal surface, metal thin film, or preferably gold, silver, platinum, palladium or copper surface. The solid support comprises a metal (preferably gold) thin film on a silicon wafer surface. The solvent is water.

ORGANIC CHEMISTRY - Preferred Component: A portion of the surface-layer is a self-assembled monolayer made of

molecules, each contains surface-adhesive head group, a linker group and/or terminal group(s). It is a self-assembled monolayer made of alkyl containing molecules. Surface adhesive head group(s) is a thiol. The linker group contains an alkyl group, polyethylene glycol, and/or an amide group. The terminal group(s) is -CH₃, -CF₃, -OH, -CHO, -COOH, -NH₂, -NHR₁, -NR₁₂, -NR₁₂R₂, -OCH₂CH₃-, -SH, -biotin, -phenyl, an-RGD (Arg-Gly-Asp peptide), or α-carbohydrate. The alkyl containing molecules contain a 1-30C alkyl. They are bonded to the solid support surface via a thiol moiety. The solvent can be an aqueous solvent, an organic solvent, a protic solvent, an aprotic solvent, and/or preferably an aqueous buffer. The stabilizing component contains amphiphilic molecules. It contains molecules of formula ABn. The stabilizing component contains N,N-dimethylformamide, dimethyl sulfoxide, N,N-dimethylacetamide, and/or N-methylformamide.

R₁, R₂ = alkyl or aryl;

A = solvent-philic moiety of amide, -OH, ether, ester, amine, sulfoxide, or preferably formamide, sulfoxide, or acetamide;

B = surface-philic moiety, preferably alkyl or aryl;

n = 1-3.

Preferred Composition: The solvent comprises minor components of non-reactive additives with a concentration of less than 15% mole fraction. The concentration of the stabilizing component in the stabilizing solution is less than or equal to 45 (preferably 0.01-15) vol.%. POLYMERS - Preferred Component: The metal thin film of the solid support

can be a plastic surface, a polymeric surface or a waveguide.

ABEX EXAMPLE - Gold (Au) (99.99%) was deposited in a high-vacuum evaporator at 2×10^{-7} Torr onto mica substrates (clear ruby muscovite mica). The mica was freshly cleaved immediately before being mounted on the substrate holder inside the vacuum chamber. The evaporation rate was 3 Angstrom /s, and the mica substrate was maintained at 625degreesK during Au deposition. After evaporation, films were annealed at 625degreesK for 20 minutes to yield relatively large Au(111) terraces, 100-200 nm in lateral dimension. Alkanethiol self-assembled monolayers (SAMs) were formed by soaking gold thin films (immediately after vacuum deposition or peeling) in 1 mM ethanolic solutions of alkanethiol. Each gold substrate remained in a thiol solution for 2-7 days at room temperature to ensure the formation of mature monolayers with high coverage and a low density of defects. The preformed SAMs were rinsed with ethanol and dried in air for less than 5 minutes prior to soaking in solvents.

L40 ANSWER 6 OF 14 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN
 ACCESSION NUMBER: 2005-664931 [68] WPIX
 DOC. NO. NON-CPI: N2005-544598 [68]
 TITLE: Surface-modified layer system
 production method involves treating polymorphic
 self-assembled monolayer
 anchored on substrate, thermally, to change structural
 form of SAM
 P42
 DERWENT CLASS: BUCK M; CYGANIK P
 INVENTOR: (UYSA-N) UNIV ST ANDREWS; (BUCK-I) BUCK M; (CYGA-I)
 PATENT ASSIGNEE: CYGANIK P
 COUNTRY COUNT: 107

PATENT INFORMATION:

PATENT NO	KIND DATE	WEEK	LA	PG	MAIN IPC
WO 2005092516	A1 20051006	(200568)*	EN	24[7]	
GB 2426724	A 20061206	(200680)	EN		
US 20070140901	A1 20070621	(200741)	EN		
GB 2426724	B 20080903	(200858)	EN		

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2005092516	A1	WO 2005-GB1159	20050324
GB 2426724	A	GB 2006-18673	20060922
US 20070140901	A1	US 2006-594654	20060926
GB 2426724	A PCT Application	WO 2005-GB1159	20050324
US 20070140901	A1 PCT Application	WO 2005-GB1159	20050324
GB 2426724	B PCT Application	WO 2005-GB1159	20050324
GB 2426724	B	GB 2006-18673	20060922

FILING DETAILS:

PATENT NO	KIND	PATENT NO
GB 2426724	A Based on	WO 2005092516 A
GB 2426724	B Based on	WO 2005092516 A

PRIORITY APPLN. INFO: GB 2004-6841

20040326

INT. PATENT CLASSIF.:

IPC ORIGINAL: B05D0001-18 [I,A]; B05D0001-18 [I,C]; B05D0003-02 [I,A];
B05D0003-02 [I,C]; B05D0003-06 [I,A]; B05D0003-06 [I,C];
G01N0031-22 [I,A]; G01N0031-22 [I,C]

IPC RECLASSIF.: B05D0001-18 [I,A]; B05D0001-18 [I,C]; B05D0003-02 [I,A];
B05D0003-02 [I,C]; B05D0005-00 [N,A]; B05D0005-00 [N,C]

ECLA: B05D0007-24

ICO: L05D0001:18C; L05D0003:02S; L05D0005:00; L05D0202:40;
L82T0201:01S; L82T0201:01T; Y01N0006:00

USCLASS NCLM: 422/057.000

BASIC ABSTRACT:

WO 2005092516 A1 UPAB: 20051223

NOVELTY - The method involves treating polymorphic self- assembled monolayer (SAM) (1) anchored on substrate (2), thermally, to change the structural form of the SAM.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for surface-modified layer system.

USE - For producing surface-modified layer system (claimed), using thermo-lithographic technique.

ADVANTAGE - Effectively increases structural perfection of thermally-treated SAM with significantly increased domain size and resistance to structural disruption by surface discontinuities in the substrate surface.

DESCRIPTION OF DRAWINGS - The figure shows a schematic view explaining the SAM patterning process.

SAM (1)
substrate (2)
pattern (3)
laser radiation (4)

TECH

INORGANIC CHEMISTRY - The substrate is made of indium phosphide, gallium arsenide, and alloys and oxides, including glass.

METALLURGY - The substrate is made of material selected from a group consisting of gold, silver, chromium, manganese, vanadium, tungsten, molybdenum, zirconium, titanium, platinum, aluminum, iron and steel.

ORGANIC CHEMISTRY - The substrate is made of indium phosphide, gallium arsenide, and alloys and oxides, including glass.

ORGANIC CHEMISTRY - The SAM which is 4-(4'-methyl-biphenyl-4-yl)-alkane-1-thiol, comprises anchor moiety and optionally substituted aryl e.g. hetero-aryl

moiety. The anchor moiety is selected from thio, seleno, carboxyl, phosphonate, phosphate and hydroxyl. The aryl moiety is selected

from phenyl, biphenyl and terphenyl, and fused ring systems selected from anthracenyl and naphthyl, and

hetero-aryl selected from bipyridyl,

terpyridyl, thiophenyl, bithienyl,

terthienyl and pyrrolyl and alicyclic moieties

selected from bridged alicyclic systems such as bi-, tri- or

tetracycloalkanes. The aryl moiety has substituent selected from

halogen, carboxy, trifluoromethyl, thiol, hydroxy, cyano, amino, nitro, Cl to C6 alkyl and carbonyl.

L40 ANSWER 7 OF 14 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN

ACCESSION NUMBER: 2004-447945 [42] WPIX

DOC. NO. CPI: C2004-168125 [42]

DOC. NO. NON-CPI: N2004-354276 [42]

TITLE: Patterning object surface in
microcontact printing involves forming one self
-assembled monolayer on the object
and the other monolayer of a complementary pattern on
uncovered regions followed by etching

DERWENT CLASS: L03; U11
 INVENTOR: DELAMARCHE E; GEISSLER M; WOLF H
 PATENT ASSIGNEE: (IBM-C) INT BUSINESS MACHINES CORP
 COUNTRY COUNT: 1

PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
US 20040102050	A1	20040527	(200442)*	EN	10[6]	
US 6893966	B2	20050517	(200533)	EN		

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
US 20040102050	A1	US 2002-307069	20021127

PRIORITY APPLN. INFO: US 2002-307069

20021127

INT. PATENT CLASSIF.:

IPC RECLASSIF.: B81C0001-00 [I,A]; B81C0001-00 [I,C]; G03F0007-00 [I,A];
 G03F0007-00 [I,C]
 ECLA: B81C0001-00F2F; G03F0007-00A
 ICO: L81C0201:03S; L82T0201:01; Y01N0004:00; Y01N0006:00
 USCLASS NCLM: 438/689.000
 NCLS: 438/686.000

BASIC ABSTRACT:

US 20040102050 A1 UPAB: 20060121

NOVELTY - Patterning the surface of an object involves forming first self-assembled monolayer (a) of first material (m1) on a layer (L1) of a surface of an object according to a desired pattern; forming a second self-assembled monolayer (b) of a second material (m2) on uncovered region of layer (L1) in a configuration that is complementary to the desired pattern and etching layer (L1) through monolayer (a).

DETAILED DESCRIPTION - Patterning the surface of an object involves forming a first self-assembled monolayer (a) of a first material (m1) on a layer (L1) of a surface of an object according to a desired pattern; forming a second self-assembled monolayer (b) of a second material (m2) on uncovered region of layer (L1) in a configuration that is complementary to the desired pattern; and etching layer (L1) through monolayer (a). Material (m1) is capable of binding to layer (L1), prevents the formation of monolayer (b) on monolayer (a) and substantially does not block the etching of an underlying region of layer (L1).

USE - In patterning the surface of an object e.g. in microcontact printing (claimed).

ADVANTAGE - The method provides a printing process of the positive type where the structures formed on the stamps have better mechanical stability; allows to fabricate more stable patterns on the stamps without requiring the use of a reactive ion etcher, thus reducing cost and process complexity; forms high resolution lines on a substrate that are produced using high-resolution grooves on the stamps allowing easier unloading; and allows fast printing operation on an object for higher manufacturing throughput.

MANUAL CODE: CPI: L04-C07

EPI: U11-C04A1B; U11-C04A1C; U11-C04D; U11-C07D1

TECH

IMAGING AND COMMUNICATION - Preferred Process: Formation of monolayer (a) involves depositing material (m1) using a negative microcontact printing utilizing a stamp surface (preferably in hydrophilized state) containing an elastomer body provided with an inking layer of material (m1), a writing technique to localize the formation of monolayer (a), or

depositing material (m1) from a solution on the substrate and forming monolayer (a) by removing material (m1) from a desired area using one of electron-beam lithography, photolithography, mechanical indentation, atomic force microscope lithography or scanning tunneling microscope lithography.

ORGANIC CHEMISTRY - Preferred Process: Formation of monolayer (b) involves depositing material (m2) from a solution. The method further involves selecting material (m1) containing at least 2 thiol groups (preferably alkyl chains attached to either thiol having less than 7 consecutive carbon atoms, especially pentaerythritoltetrakis (3-mercaptopropionate) molecules) or cysteamine hydrochloride. The method further involves selecting material (m2) containing a thiol having at least 7 consecutive carbon atoms (preferably eicosanethiol). Etching of layer (L1) containing gold is performed in a solution of cyanide containing oxygen and having a pH of approximately 12, and etching of layer (L1) containing copper is performed in a solution of peroxodisulfate.

L40 ANSWER 8 OF 14 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN
 ACCESSION NUMBER: 2004-430162 [40] WPIX
 CROSS REFERENCE: 2004-095982; 2005-028796
 TITLE: Formation of self-aligned pattern on existing pattern on substrate by applying a coating of masking material to top surface of substrate, and allowing portion of masking material to attach to portions of existing pattern to top surface
 A85; E19; L03; U11
 DERWENT CLASS: COLBURN M E; GATES S M; HEDRICK J C; HUANG E; NITTA S V;
 INVENTOR: PURUSHOTHAMAN S; SANKARAPANDIAN M
 PATENT ASSIGNEE: (IBM-C) INT BUSINESS MACHINES CORP
 COUNTRY COUNT: 1

PATENT INFORMATION:

PATENT NO	KIND DATE	WEEK	LA	PG	MAIN IPC
US 20040087177	A1	20040506	(200440)*	EN	20[8]

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
US 20040087177	A1 Div Ex	US 2002-287935	20021105
US 20040087177	A1	US 2003-421355	20030424

FILING DETAILS:

PATENT NO	KIND	PATENT NO
US 20040087177	A1 Div ex	US 6641899 B

PRIORITY APPLN. INFO: US 2002-287935 20021105
 US 2003-421355 20030424

INT. PATENT CLASSIF.:

IPC RECLASSIF.: G03F0007-16 [I,A]; G03F0007-16 [I,C]
 ECLA: G03F0007-16L
 USCLASS NCLM: 438/758.000
 NCLS: 428/195.100; 438/778.000; 438/780.000

BASIC ABSTRACT:

US 20040087177 A1 UPAB: 20090327

NOVELTY - A self-aligned pattern on an existing pattern on a substrate having a top surface is formed by applying a coating of the masking material to the top surface of the substrate; and allowing a portion of the masking material to preferentially attach to portions of the existing pattern to the top surface.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(a) a structure comprising a self aligned pattern on an existing pattern on a substrate; and

(b) a composition for selectively coating a pattern on a substrate, comprising a carrier material for application to the substrate; and a polymer in the carrier that reactively grafts to regions of the substrate having first chemical characteristics.

The self-aligned pattern includes a masking material having an affinity for portions of the existing pattern, so that the masking material preferentially reactively grafts to the portions of the existing pattern.

USE - For forming a self-aligned pattern on an existing pattern on a substrate.

ADVANTAGE - The self-aligned pattern is fabricated accurately and inexpensively without the use of lithography. The use of self-aligned masks allows a simplified fabrication process in which the effective dielectric constant between metal lines can be reduced through selective application of various materials to the metal lines. This is central to maximizing the propagation speed of interconnect signals and ultimately provides faster overall circuit performance. Further, the inventive method leads to a higher level of protection and reliability of interconnect structures as the errors attributed to conventional patterning methods are eliminated and to reduced processing costs. The use of the self-aligned masks allows a unique process in which the masks can be generated without the need to perform additional pattern defining steps.

DESCRIPTION OF DRAWINGS - The figure is a cross sectional view of a semiconductor device.

Interconnect structure (30)

Interlayer dielectric (31)

Metal wiring (32)

Liner barrier layer (34)

Cap barrier layer (36)

MANUAL CODE: CPI: A11-B05; A12-E07C; E05-A; E05-E; E10-A01; E10-A03B;
E10-A04B1B; E10-A04B1D; E10-A04B2B; E10-A04B2D;
E10-A09B4; E10-A09B8; E10-A16B; E10-A23B; E10-E04;
E10-F02; E10-F02A2; E10-G01; E10-H04; E31-P06B; E31-P06E;
E35-A; L04-C06; L04-C10A
EPI: U11-C04B; U11-C05D3

TECH

ELECTRONICS - Preferred Component: The pattern applied to the top surface comprises a first set of regions of the substrate having a first atomic composition, and a second set of regions of the substrate having a second atomic composition different from the first composition. The masking material comprises a self-assembled monolayer that selectively binds to the second set of regions of the pattern. The first set of regions includes one or more metal elements. The second set of regions includes a dielectric. The areas of second atomic composition are patterned electrical interconnects. The substrate is a silicon wafer containing microelectronic devices, a ceramic chip carrier, an organic chip carrier, a glass substrate, a gallium arsenide substrate, a silicon carbide substrate, a semiconductor wafer, a circuit board, or a plastic substrate. The masking material also includes a reactive molecule having functional groups for polymerization propagation; a composition where polymerization proceeds by reactions that combine monomers and polymers having two or more functionalities that react with each other to produce polymers of a larger molecular weight; or the reactive molecule, where

reaction of the reactive molecule with the portion of the pattern generates a layer having reactive groups, which participate in step growth polymerization. The structure further comprises conductive feature(s) formed on the substrate; and conductive barrier layer(s). The substrate further comprises insulating layer(s) surrounding the conductive feature. The conductive barrier layer is disposed at interface(s) between the insulating layer and the conductive feature. The insulating layer surrounds the conductive feature at its bottom and lateral surfaces. Preferred Method: The method further comprises applying a reactive monomer to the layer of functional groups so that the reactive monomer polymerizes on the layer, applying the reactive monomer which undergoes polymerization on the layer, or applying the reactive monomer having one or more functionalities to the layer to form a self-aligned mask layer; preparing a polymer to act as the masking material; forming a condensed phase containing the polymer or the reactive molecule, and contacting the portions of the pattern with the condensed phase; preparing the reactive molecule or the reactive monomer; removing the masking material from the portions of the pattern to which it does not attach; and chemically treating regions of the substrate prior to applying the coating. The polymerization comprises a chain growth mechanism wherein polymerization proceeds through addition of a monomer to a reactive polymer. The removing step is accomplished through rinsing, ultrasonication, dissolution, thermolysis, irradiation, or annealing. The masking material is applied to the substrate by a spin coating, scan coating, dip coating or spray coating, or using a doctor blade. The chemically treating step includes plasma treatment, application of an oxidizing or reducing solution, annealing in a reducing or oxidizing atmosphere, or application of a material that renders surface portions of the substrate, to which it is applied, to be hydrophobic or hydrophilic; and applying an organosilane comprising SixLyRz. It changes the wetting characteristics of the regions of the substrate. The reactive monomer polymerizes when exposed to a free radical, an anion, a cation, and a transition metal catalyst; or polymerizes when exposed to thermal annealing or irradiation. The reactive molecule or reactive monomer is prepared in a vapor phase. The irradiating step includes exposure to ultraviolet light, visible light, x-rays, or electrons.

L = hydroxy, methoxy, ethoxy, acetoxy, alkoxy, carboxy, amines, or halogens; and

R = hydrido, Me, Et, vinyl, or Ph (any alkyl or aryl).

POLYMERS - Preferred Material: The masking material comprises a polymer containing a reactive grafting site that selectively binds to the second set of regions of the pattern applied to the top surface; or a polymer that is generated from the reactive molecule that binds to the portions of the pattern to provide a molecular monolayer of functional groups. Preferred Component: The coating comprises a polymer that covalently bonds to the portions of the pattern. The polymer is poly(oxides), poly(carbonates), poly(esters), poly(anhydrides), poly(urethanes), poly(sulfonates), poly(siloxanes), poly(sulfides), poly(thioethers), poly(thioesters), poly(sulfones), poly(sulfonamides), poly(amides), poly(imines), poly(ureas), poly(phosphazene), poly(silanes), poly(siloxanes), poly(silazane), poly(nitriles), poly(imides), poly(oxazole), poly(benzoxazole), poly(thiazoles), poly(pyrazoles), poly(triazoles), poly(thiophenes), poly(oxadiazole), poly(thiazine), poly(thiazoles), poly(quinoxaline), poly(benzimidazoles), poly(oxindoles), poly(indolines), poly(pyridines), poly(triazines), poly(piperazine), poly(pyridines), poly(piperidines), poly(pyrrolidines), poly(carborane), poly(fluoresceins), poly(acetals), or poly(anhydrides). The polymer is an amorphous polymeric system having any chain architecture; a main chain acyclic hetero-atom polymer; a main chain heterocyclic polymer; or one of linear, networked, branched, and dendrimeric. It has an acyclic main

chain, a carbon containing backbone, and a reactive functional group serving as the grafting site.

ORGANIC CHEMISTRY - Preferred Component: The functional group is acyl chlorides, anhydrides, hydroxy, esters, ethers, aldehydes, ketones, carbonates, acids, epoxies, aziridines, phenols, amines, amides, imides, isocyanates, thiols, sulfones, halides, phosphines, phosphine oxides, nitros, azo, benzophenones, acetals, ketals, diketones, or the organosilanes. The reactive monomer comprises a monomeric ring. It is dienes, alkene, acrylics, methacrylic, acrylamides, methacrylamides, vinyl ethers, vinyl alcohols, ketones, acetals, vinyl esters, vinyl halide, vinyl nitrile, styrene, vinyl pyridine, vinyl pyrrolidone, vinyl imidazoles, vinyl heterocyclics, cyclic lactam, cyclic ether, cyclic lactones, cycloalkene, cyclic thioester, cyclic thioether, aziridines, phosphazine, siloxane, oxazoline, oxazine, thiirane, caprolactone, propylene glycol, or a substituted ethylenic organic molecule. The reactive molecule is bi-functional. It includes a first moiety that binds to the portions of the pattern; and a second moiety that serves as a polymerization initiator, a monomeric unit, or a reaction site. It is deposited as a thin layer or a molecular monolayer. The first moiety is acyl chloride, anhydride, hydroxy, ester, ether, aldehyde, ketone, carbonate, acid, epoxy, aziridine, phenol, amine, amides, imides, isocyanates, thiols, sulfones, halides, phosphines, phosphine oxides, nitros, azo, benzophenones, acetals, ketals, diketone, or the organosilane; or the organosilane, hydroxy, acyl chloride, or carboxylic acid. The second moiety comprises a substituted ethylenic organic molecule, or a monomeric ring. It is dienes, alkenes, acrylics, methacrylic, acrylamides, methacrylamides, vinyl ethers, vinyl alcohols, ketones, acetals, vinyl esters, vinyl halide, vinyl nitrile, styrene, vinyl pyridines, vinyl pyrrolidone, vinyl imidazoles, vinyl heterocyclics, styrene, cyclic lactams, cyclic ethers, cyclic lactones, cycloalkenes, cyclic thioesters, cyclic thioethers, aziridines, phosphazines, siloxanes, oxazolines, oxazine, or thiirane; amines, nitrites, alcohols, carboxylic acids, sulfonic acids, isocyanate, acyl chloride, ester, amide, anhydride, epoxy, halide, acetoxy, vinyl, or silanol; or peroxide, nitroxide, halide, azo, perester, thioester, hydroxy, metal organics having the stoichiometry of RX. The one or more functionalities react with each other to form a covalent bond. The functionalities are provided by one or more functional groups from amines, nitriles, alcohols, acids, carboxylic acids, sulfonic acids, isocyanates, acyl chlorides, esters, amides, anhydrides, epoxies, halides, acetoxy, vinyl, or silanol. The condensed phase is a liquid. The liquid is a solvent for the polymer, a solvent for the reactive molecule, or a solvent for the reactive monomer.

R = benzyl, cumyl, butyl, alkyl, or naphthalene; and

X = sodium, lithium, and potassium; protonic acids, Lewis acids, carbenium salts, tosylates, triflates, benzophenones, aryldiazonium, diaryliodonium, triarylsulfonium, acetals, ketals, or diketones.

INORGANIC CHEMISTRY - Preferred Component: The areas of second atomic composition comprise copper.

L40 ANSWER 9 OF 14 WPIX COPYRIGHT 2009

THOMSON REUTERS on STN

ACCESSION NUMBER: 2004-023263 [02] WPIX

DOC. NO. CPI: C2004-007311 [02]

DOC. NO. NON-CPI: N2004-018013 [02]

TITLE: Forming inorganic structure, for use as e.g. electronic photonic and nano composite materials, comprises providing substrate with repeat protein polymer, and exposing substrate to precursor containing inorganic species

DERWENT CLASS: J04; P42

INVENTOR: KUMAR M

PATENT ASSIGNEE: (DOWO-C) DOW CORNING CORP.; (GEMV-C) GENENCOR INT INC;
(KUMA-I) KUMAR M
COUNTRY COUNT: 101

PATENT INFORMATION:

PATENT NO	KIND DATE	WEEK	LA PG	MAIN IPC
WO 2003099465	A1 20031204	(200402)*	EN 27[0]	
US 20040014186	A1 20040122	(200407)	EN	
AU 2003233579	A1 20031212	(200443)	EN	
EP 1509336	A1 20050302	(200517)	EN	
AU 2003233579	A8 20031212	(200559)	EN	
US 7381789	B2 20080603	(200839)	EN	

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2003099465	A1	WO 2003-US15757	20030520
US 20040014186	A1 Provisional	US 2002-381913P	20020520
AU 2003233579	A1	AU 2003-233579	20030520
AU 2003233579	A8	AU 2003-233579	20030520
EP 1509336	A1	EP 2003-729016	20030520
US 20040014186	A1	US 2003-441965	20030520
EP 1509336	A1	WO 2003-US15757	20030520
US 7381789	B2 Provisional	US 2002-381913P	20020520
US 7381789	B2	US 2003-441965	20030520

FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 2003233579	A1 Based on	WO 2003099465 A
EP 1509336	A1 Based on	WO 2003099465 A
AU 2003233579	A8 Based on	WO 2003099465 A

PRIORITY APPLN. INFO: US 2002-381913P 20020520
US 2003-441965 20030520

INT. PATENT CLASSIF.:

IPC ORIGINAL: C07K0017-00 [I,A]; C07K0017-00 [I,C]
IPC RECLASSIF.: B05D0001-36 [I,A]; B05D0001-36 [I,C]; B05D0007-00 [I,A];
B05D0007-00 [I,C]; C07K0014-00 [I,A]; C07K0014-00 [I,C];
C07K0017-00 [I,C]; C07K0017-14 [I,A]; C08J0007-00 [I,C];
C08J0007-06 [I,A]; C09D0001-00 [I,A]; C09D0001-00 [I,C];
C09D0189-00 [I,A]; C09D0189-00 [I,C]; C12P0003-00 [I,A];
C12P0003-00 [I,C]

ECLA: C07K0014-00B1; C07K0017-14

ICO: Y01N0002:00

USCLASS NCLM: 435/168.000

NCLS: 530/400.000; 530/420.000; 977/715.000

BASIC ABSTRACT:

WO 2003099465 A1 UPAB: 20060120

NOVELTY - Forming an inorganic structure comprises providing substrate with a repeat protein polymer, and exposing the substrate to a precursor comprising inorganic species. The repeat protein polymer catalyzes the formation of an inorganic structure on the substrate.

DETAILED DESCRIPTION - Forming inorganic structure comprises providing substrate with repeat protein polymer, and exposing the substrate to a precursor comprising inorganic species. The repeat protein polymer catalyzes

the formation of an inorganic structure on the substrate. The repeat protein polymer has formula $Ty((Anx(B)b(A'n')x'(B')b'(A''n'')x''))iT'y'$.

A, A' and A'' = individual unit of repeat amino acid sequence;

B, B' and b' = any amino acid sequence of 4-50 amino acids;

n, n' and n'' = at least 2 - 250;

i = 1-100;

T, T', y and y' = 1-100 amino acid sequence containing fewer than 20% of the amino acids in the repeat protein copolymer; and

x = 0- at least 1 and varies with the number of different amino acids in A to provide for at least 30 amino acids in each A repeat sequence.

USE - Used for forming inorganic structure useful for, e.g. electronic photonic and nano composite materials.

ADVANTAGE - The process is highly controlled from the nanometer scale to the macroscopic scale.

MANUAL CODE: CPI: J04-E

TECH

BIOLOGY - Preferred Components: The substrate has repeat protein polymers on it. Each repeat protein polymer are the same or different from another at least one of the repeat protein polymer. The repeat protein polymer has a SEQ ID NO. 20-25. The inorganic species comprises species containing silicon, zirconium, silver (preferred), copper, cadmium, tantalum, yttrium, iron, titanium, cobalt, and/or calcium. The inorganic species is preferably tetraethyl orthosilicate (TEOS), 3-aminopropyltriethoxy silane, and/or phenyl tri ethoxy silane. The inorganic species is yttrium ethoxide, silver nitrate, and/or calcium chloride. The substrate has a surface. The repeat protein polymer is on a portion of the surface of the substrate. The inorganic structure forms on the surface of the substrate in areas with repeat protein polymer. The repeat protein polymer forms a pattern on the surface. The inorganic structure forms on the substrate in areas with the repeat protein polymer. The inorganic structure has features with a size of 1-999 nm. The repeat polymer comprises self-assembled monolayer on the substrate. The inorganic structure comprises meso porous fibrous silica particles. The repeat protein polymer has an overall cationic charge. The repeat protein polymer has lysine(s). Preferred Methods: The method also comprises placing the repeat protein polymer on the substrate with soft lithographic stamp, and placing the repeat protein polymer on the substrate by rapid printing. The method also comprises providing second repeat protein polymer in contact with the first organic structure. The first and second inorganic structures comprise single inorganic structure containing 3-dimensional structure.

ABEX DEFINITIONS - Preferred Definitions: - A, A' and A'' = 3-30, preferably SEQ ID NO. 1, 3-11; - i = 1-50, preferably 1-30; and - T = 1-60 amino acid sequence.

L40 ANSWER 10 OF 14 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN

ACCESSION NUMBER: 2004-022536 [02] WPIX

DOC. NO. CPI: C2005-142522 [48]

DOC. NO. NON-CPI: N2005-379459 [48]

TITLE: Deriving fluid-imperious surface with mixed monolayer used in lab-on-a-chip technology, by exposing base surface to first solution, removing portion of monolayer, and exposing base surface portion to second molecule(s)
A35; A85; A89; A96; B04; D16; D22; J04; L03; P42; S03; U11; U12; U13

INVENTOR: BABCOCK B

PATENT ASSIGNEE: (BABCOCK I) BABCOCK B

COUNTRY COUNT: 99

PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN	IPC
WO 2003076082	A2	20030918	(200402)*	EN	34	[10]	
AU 2002367538	A1	20030922	(200431)	EN			
US 20050227232	A1	20051013	(200567)	EN			
AU 2002367538	A8	20051020	(200615)	EN			

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2003076082	A2	WO 2002-US35134	20021101
US 20050227232	A1 Provisional	US 2001-335165P	20011101
AU 2002367538	A1	AU 2002-367538	20021101
US 20050227232	A1	WO 2002-US35134	20021101
US 20050227232	A1	US 2004-494122	20040812
AU 2002367538	A8	AU 2002-367538	20021101

FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 2002367538	A1 Based on	WO 2003076082 A
AU 2002367538	A8 Based on	WO 2003076082 A

PRIORITY APPLN. INFO: US 2001-335165P 20011101
 US 2004-494122 20040812

INT. PATENT CLASSIF.:

MAIN: B01J019-00
 B05D001-28
 SECONDARY:
 IPC RECLASSIF.: B01L0003-00 [I,A]; B01L0003-00 [I,C]; B05D0001-18 [I,A];
 B05D0001-18 [I,C]; B05D0003-00 [I,A]; B05D0003-00 [I,C];
 B05D0003-12 [I,A]; B05D0003-12 [I,C]; C07B0061-00 [N,A];
 C07B0061-00 [N,C]; C12M0001-34 [I,A]; C12M0001-34 [I,C];
 C12Q0001-68 [I,A]; C12Q0001-68 [I,C]
 ECLA: B01L0003-00C6M; B05D0001-18C; B05D0003-00S; B05D0003-12;
 C12Q0001-68B10A+527/150+527/125+523/308
 ICO: L01J0219:00C; L01L0300:00S; L01L0400:08P4; M07B0061:00L;
 M07M0011:00; Y01N0006:00
 USCLASS NCLM: 435/006.000
 NCLS: 427/002.110; 435/287.200

BASIC ABSTRACT:

WO 2003076082 A2 UPAB: 20060120

NOVELTY - Derivatizing fluid-impervious surface with mixed monolayer by exposing base surface with proximal and distal portion(s) to first solution to form monolayer surface, removing portion of monolayer to expose base surface portion, and exposing base surface portion to second molecule(s). The second molecule(s) has functional group with different surface energy to form surface energy gradient.

DETAILED DESCRIPTION - Deriving fluid-impervious surface with mixed monolayer comprises exposing base surface with proximal and distal portion(s) to a first solution to promote formation of self-assembled monolayer from solution for time to form monolayer surface, removing portion of the monolayer such that portion of the base surface is again exposed, and exposing portion of the base surface to second molecule(s). The first solution comprises molecule(s) of formula X-J-M1. The second molecule(s) includes functional group with different surface energy from the functional group removed in the removing step to form a surface energy gradient from a proximal location to a distal location.

M1, X = separate functional groups; and
J = spacer moiety.

USE - For deriving fluid-impervious surface with mixed monolayer useful in lab-on-a-chip technology (claimed).

ADVANTAGE - The invention allows to produce micro-fabricated systems smaller and more energy-efficient. It provides fluid to be transported with minimal or reduced external forces.

DESCRIPTION OF DRAWINGS - The figure shows a blown-up schematic view of the method for producing mixed monolayer surface energy gradient. MANUAL CODE: CPI: A10-E01; A11-C04D; A12-E13; A12-L04B; A12-V03C2;

A12-V03D; B04-C03; B05-A01B; B05-A02; B05-A03; B05-B02C;
D05-H10; D09-C05; J04-B01; L04-C22
EPI: S03-E15; U11-A09; U11-C05A; U11-C05B9; U11-C18B9;
U12-B03F1; U13-D04

TECH

INORGANIC CHEMISTRY - Preferred Methods: The portion of monolayer is removed while the base and monolayer surfaces are immersed in the first or second solution, or while a third solution amount containing molecule of formula X-J-M2 is increased.

J, X = separate functional groups;

X = carboxylic acids or sulfur-containing functional group, e.g. thiols, (dis)ulfides, (chloro)silanes, (iso)nitriles, hydroxamic acid, phosphoryl groups, sulfonyl groups, hydroxyl group, or amino acid groups;

J = preferably hydrocarbon chain of formula (CH₂)_n, e.g. methyl, propenyl, ethynyl, cyclohexyl, phenyl, tolyl, or benzyl;

M = -OH, -OHNH-, -CONHCO-, -NH₂, -NH-, -COOH, -COOR, -CSNH-, -NO₂-, -SO₂-, -RCOR-, -RCSR-, -RSR-, -ROR-, -PO₄-3, -OSO₃-2, -SO₃-, -NHxR₄-x+, -COO, -SOO-, -RSOR, -CONR₂, -(OCH₂CH₂)_nOH, -CH₃, -PO₃H-, 2-imidazole, -N(CH-sub.3), -NR₂, -PO₃H₂, -CN, -(CF₂)_n, CF₃, CO₂CH₃, CONHCH₃, CH₃, CHCH₂, OCH₂CF₂CF₃, (CF₂)₅CF₃, (CF₂)₇CF₃, OCH₃, Cl, CN, Br, or olefins; n = 1-22;

R = H or organic group, e.g. hydrocarbon or fluorinated hydrocarbon including (cyclo)alkyl, alkenyl, alkynyl, aryl, alkaryl, or aralkyl; and

M2 = functional group with different surface energy than M1 to allow the mixed monolayer surface of the two moieties to be formed with an increasing molar ratio M2:M1 to create a gradient.

The portion of monolayer is removed by passing an instrument along the monolayer surface with force, etching chemically the monolayer portion, cutting with laser or water, drilling, sonic mechanism, etching through thermometric exposure, blasting with grit, or cutting with an instrument. The monolayer is preferably removed by atomic force microscopy probe or scanning probe lithography probe.

Preferred Components: The gradient is created on the inside or outside of the tube, or on face(s) of a rectangular channel. The base surface is metal (oxide). The metal oxide comprises silica, alumina, quartz, or glass. The metal is gold, silver, copper, cadmium, zinc, palladium, platinum, mercury, lead, iron, chromium, manganese, tungsten, or their alloys. The base surface can also be germanium, gallium, arsenic, gallium arsenide, epoxy compounds, polysulfone compounds, plastics, polyanhydride, poly lactic acids, polyglycolic acid, or other polymers.

L40 ANSWER 11 OF 14	WPXI COPYRIGHT 2009	THOMSON REUTERS on STN
ACCESSION NUMBER:	2003-765226 [72]	WPXI
CROSS REFERENCE:	2004-088997	
DOC. NO. CPI:	C2003-210013 [72]	
DOC. NO. NON-CPI:	N2003-612910 [72]	
TITLE:	Formation of anti-charging layers for beam lithography, comprises applying self-assembled monolayer with metal ligand	

sites to substrate, binding metal deposit to ligand sites, and applying resist to metal deposit
 A26; A89; G06; L03; P84; U11
 DERWENT CLASS: BRANDOW S L; CHEN M; DOBISZ E; DRESSICK W J
 INVENTOR: (BRAN-I) BRANDOW S L; (CHEN-I) CHEN M; (DOBI-I) DOBISZ E;
 PATENT ASSIGNEE: (DRES-I) DRESSICK W J; (USNA-C) US SEC OF NAVY; (USNA-C) US SEC OF NAVY NAVAL RES LAB
 COUNTRY COUNT: 93

PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
US 20020177083	A1	20021128	(200372)*	EN	18	[11]
US 6586158	B2	20030701	(200372)	EN		
WO 2002095787	A2	20021128	(200372)	EN		
AU 2002321990	A1	20021203	(200452)	EN		
AU 2002321990	A8	20051006	(200612)	EN		

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
US 20020177083	A1	US 2001-864384	20010525
AU 2002321990	A1	AU 2002-321990	20020208
WO 2002095787	A2	WO 2002-US3885	20020208
AU 2002321990	A8	AU 2002-321990	20020208

FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 2002321990	A1	Based on
AU 2002321990	A8	Based on

PRIORITY APPLN. INFO: US 2001-864384 20010525

INT. PATENT CLASSIF.:

MAIN: G03F007-00; G03F007-16
 SECONDARY: G03F007-00
 IPC RECLASSIF.: G03C0005-04 [I,A]; G03C0005-04 [I,C]; G03C0007-04 [N,A];
 G03C0007-04 [N,C]; G03F0007-09 [I,A]; G03F0007-09 [I,C];
 G03F0007-16 [I,A]; G03F0007-16 [I,C]
 ECLA: G03C0005-04; G03F0007-09C; G03F0007-16L
 ICO: S03C0007:04
 USCLASS NCLM: 430/324.000
 NCLS: 430/005.000; 430/296.000; 430/322.000; 430/942.000;
 430/967.000

BASIC ABSTRACT:

US 20020177083 A1 UPAB: 20050905

NOVELTY - Formation of anti-charging layers for beam lithography comprises applying a self-assembled monolayer (SAM) (26) having metal ligand sites to a substrate (20), binding a metal deposit to the ligand sites of the metal ligating self-assembled monolayer, and applying a resist to the metal deposit.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for:

(1) a method for conducting beam lithography comprising applying a SAM having metal ligand sites to a resist, binding a metal deposit to the SAM, forming an anti-charging layer, exposing the resist with a beam, and developing the resist; and

(2) an improved resist layer comprising a layer of polymer resist, disposed over a wafer for lithographic patterning, a metal deposit for conductively dissipating charge, in contact with the polymer resist layer either directly or through a SAM, and a ground connect for connecting the metal deposit to the ground.

USE - For forming anti-charging layers for conducting beam lithography (claimed) and mask fabrication.

ADVANTAGE - The formation of anti-charging layers reduces beam displacement and increases pattern placement accuracy. The method utilizes economical wet chemical processing involving simple dip-coating or spin-coating steps for application of the charge dissipation layer. The use of electroless plating without the metal-binding organosiloxane film offers similar cost advantages. The method offers a unique, economical method for controlling workpiece charging.

DESCRIPTION OF DRAWINGS - The figure shows the successive stages of using a SAM-metal layer to reduce charging in e-beam lithography using electroless plating of metal on SAM on bare substrate or polymer prior to photoresist coating.

substrate (20)

planarizer (23)

self-assembled mono layer (26)

MANUAL CODE: CPI: A12-E07C; A12-L02B2; G06-A; G06-D06; G06-E02;
G06-E04; G06-F03C; G06-G17; G06-G18; L04-C06A
EPI: U11-C04F1; U11-C04F2; U11-C04G1; U11-C04G2

TECH

ELECTRONICS - Preferred Method: Alternately, a resist is applied to a substrate, an SAM (II) having metal ligand sites is applied to the metal, and a metal deposit (II) is bound to the SAM (II). The SAM is applied by physisorption, chemisorption, wet chemical dipping, or spin casting. The metal deposit forms a conductive pathway. The step of binding the metal deposit to the ligand sites, involves binding by electroless metallization. The metal deposit is removed. Preferred Substrate: The substrate is patterned or non-patterned. The substrate is a surface with a planarizer (23).

Preferred Resist: The resist is a composite SAM film.

ORGANIC CHEMISTRY - Preferred Compound: The SAM is assembled from monomers having formula $RSiR'nX3-n$, where R is a ligand group, R' is an alkyl or aryl group, X is a halide or alkoxide group, and n is 0-2.

METALLURGY - Preferred Metals: The metal is chosen from copper, cobalt, nickel and gold.

ABEX EXAMPLE - A ligand self-assembled monolayer

(SAM) organosilane layer was deposited from a 1 vol% aqueous solution of (2-aminoethyl)-3-aminopropyltrimethoxysilane (EDA) containing 0.001 M acetic acid (pH 5). A puddle of the EDA solution was placed on the substrate surface for approximately 15 seconds. Excess solution was removed by spin-casting at 3000 rpm for 15 seconds while rinsing the substrate in a stream of water, followed by spinning an additional 15 seconds to remove water. The substrate was dried by baking at 120degreesC for 4 minutes to complete the chemisorption of the EDA SAM. A palladium/tin catalyst was applied for 5 minutes and the sample was gently rinsed 3 times in 0.1 M hydrochloric acid (aq). An accelerator was applied for 90 seconds and removed. Copper was then deposited by immersion of the substrate in copper bath for 30 seconds at 25degreesC. The resist was then spun onto the copper-coated workpiece and processed, exposed, and developed under standard conditions. The developed pattern was wet-etched into the 15 nm thick copper layer by a 5-10 second immersion in 50% nitric acid solution. The pattern was etched into the planarizer and then into the substrate. The resist was removed, followed by 5-10 second immersion in 50% nitric acid to remove the remaining copper

discharge layer. The planarizer was then removed.

L40 ANSWER 12 OF 14 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN
 ACCESSION NUMBER: 2003-671372 [63] WPIX
 DOC. NO. CPI: C2003-183086 [63]
 TITLE: Reversibly modifying property of
 surface e.g. plate for offset printing or
 chromatographic medium, comprises depositing nanolayer of
 material and applying external stimulus so that nanolayer
 shifts to different conformation state
 DERWENT CLASS: B04; E17; J04; P81
 INVENTOR: LAHANN J; LANGER R S; MITRAGOTRI S; MITRAGOTRI S S
 PATENT ASSIGNEE: (LAHA-I) LAHANN J; (LANG-I) LANGER R S; (MASI-C)
 MASSACHUSETTS INST TECHNOLOGY; (MITR-I) MITRAGOTRI S S
 COUNTRY COUNT: 99

PATENT INFORMATION:

PATENT NO	KIND DATE	WEEK	LA PG	MAIN IPC
WO 2003055590	A2 20030710	(200363)*	EN 66[12]	
US 20030142901	A1 20030731	(200363)	EN	
AU 2002365147	A1 20030715	(200421)	EN	
EP 1441695	A2 20040804	(200451)	EN	
AU 2002365147	A8 20051020	(200615)	EN	
US 7020355	B2 20060328	(200623)	EN	
US 20060263033	A1 20061123	(200678)	EN	

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2003055590	A2	WO 2002-US34970	20021101
US 20030142901	A1 Provisional	US 2001-350090P	20011102
US 7020355	B2 Provisional	US 2001-350090P	20011102
US 20030142901	A1	US 2002-284794	20021031
US 7020355	B2	US 2002-284794	20021031
AU 2002365147	A1	AU 2002-365147	20021101
AU 2002365147	A8	AU 2002-365147	20021101
EP 1441695	A2	EP 2002-803299	20021101
EP 1441695	A2	WO 2002-US34970	20021101
US 20060263033	A1 Provisional	US 2001-350090P	20011102
US 20060263033	A1 Div Ex	US 2002-284794	20021031
US 20060263033	A1	US 2006-390405	20060327

FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 2002365147	A1 Based on	WO 2003055590 A
EP 1441695	A2 Based on	WO 2003055590 A
AU 2002365147	A8 Based on	WO 2003055590 A
US 20060263033	A1 Div ex	US 7020355 B

PRIORITY APPLN. INFO: US 2002-284794 20021031
 US 2001-350090P 20011102
 US 2006-390405 20060327

INT. PATENT CLASSIF.:

MAIN: B01J019-00
 IPC ORIGINAL: G02B0006-00 [I,A]; G02B0006-00 [I,C]; G02B0006-35 [I,A];

IPC RECLASSIF.: G02B0006-35 [I,C]; H01M0004-86 [I,A]; H01M0004-86 [I,C]; A61K0009-00 [I,A]; A61K0009-00 [I,C]; B01J0020-281 [I,C]; B01J0020-286 [I,A]; B01J0020-30 [I,C]; B01J0020-32 [I,A]; B01L0003-00 [I,A]; B01L0003-00 [I,C]; B05D0001-18 [N,A]; B05D0001-18 [N,C]; B05D0005-04 [N,A]; B05D0005-04 [N,C]; B05D0005-08 [N,A]; B05D0005-08 [N,C]; B29C0059-00 [I,C]; B29C0059-16 [I,A]; B41C0001-10 [I,A]; B41C0001-10 [I,C]; C40B0060-14 [N,A]; C40B0060-14 [N,C]; F15C0005-00 [I,A]; F15C0005-00 [I,C]; F16K0099-00 [I,A]; F16K0099-00 [I,C]; G01N0030-00 [N,A]; G01N0030-00 [N,C]; G02B0006-35 [I,A]; G02B0006-35 [I,C]; G11B0007-00 [N,C]; G11B0007-0045 [N,A]; G11C0013-02 [I,A]; G11C0013-02 [I,C]; H01M0008-04 [I,A]; H01M0008-04 [I,C]; H01M0008-06 [I,A]; H01M0008-06 [I,C]; B01J0020-286; B01J0020-32; B01L0003-00C2S; B01L0003-00C6M; B29C0059-16; B41C0001-10B; F16K0099-00M; G02B0006-35L; G11C0013-02; H01M0008-04C2E; H01M0008-06C L01J0219:00C2D24D; L01L0003:00C2S; L01L0003:00C6M; L01L0300:00G14; L01L0300:00G4S; L01L0400:00G6S; L05D0001:18C; L05D0005:04; L05D0005:08; L82T0201:01; M40B0060:14; S01N0030:00+L01D15/20; S01N0030:00+L01D15/38S; S02B0006:35E4; S02B0006:35N4D2; S02B0006:35P4; S02B0006:35P4E; S11B0007:0045; T01M0008:04F; Y01N0004:00; Y01N0006:00

USCLASS NCLM: 385/016.000
NCLS: 365/151.000; 365/153.000; 429/041.000

BASIC ABSTRACT:

WO 2003055590 A2 UPAB: 20060120

NOVELTY - Reversibly modifying a property of a surface comprises depositing a nanolayer of a material on the substrate and applying an external stimulus to the nanolayer. When the stimulus is applied, the nanolayer shifts from a first conformation state to a second conformation state.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(a) operating a microfluidic system which comprising adjusting the conformation state of portions of a surface to create a predetermined pattern of channels defined by hydrophilic and hydrophobic regions; and

(b) a switch for a waveguide positioned at a junction between an incoming waveguide and first and second outgoing waveguides, which comprises a chamber having a surface and containing a liquid and a gas and an interface between them. The surface comprises a nanolayer of material.

USE - The reversibly modified surface is used in a plate for offset printing, a data storage medium, a polymer electrolyte membrane fuel cell, a switch for a waveguide, a microfluidic system, a biosensor or a medium for chromatographic separation (all claimed). It is used to produce optical switches, useful in e.g. cross connects and add drop multiplexers, and for use in fiber optical devices, drug delivery, exploiting simultaneous dual surface properties, electronic and physical applications, biological and chemical applications, absorption and desorption in response to an external stimulus, and photolithography.

ADVANTAGE - The process dynamically controls surface wettability without chemical reactions, but exploits conformational transitions of molecules conformed as a low-density film on a surface. MANUAL CODE: CPI: B04-C03; B05-B02C; B10-C04E; E10-C04D2; J04-C

TECH

CHEMICAL ENGINEERING - Preferred Components: When the nanolayer is in the first and second conformation states, the surface is attributed by a first and second property, respectively. The property is the degree of hydrophilicity, degree of hydrophobicity, electrical charge, chemical composition, polarizability, transparency, conductivity, light absorption, affinity for a biomolecule, affinity for a small molecule, affinity for a bioactive agent, osmotic potential, zeta potential, surface energy,

coefficient of friction and/or tackiness.

The change in conformation state comprises a change from a cis to a trans configured double bond, rotating a molecular group about an axis, opening a hinged molecular group, bending a molecular chain or unbending a molecular chain. The monolayer comprises a self-assembled monolayer comprising molecular assemblies each having a cleavable end-group. It comprises molecular assemblies each comprising first and second information carriers.

Preferred Method: The external stimulus is application of a voltage, a change in an applied voltage, a change in temperature, a change in pH, exposure to UV light, exposure to electromagnetic radiation, application of a magnetic field, removal of a magnetic field, a change in capacitance, application of an electrostatic charge and/or removal of an electrostatic charge, or exposure to a ligand, exposure to a biomolecule, exposure to a small molecule, exposure to a bioactive agent and/or exposure to an ion.

The substrate comprises a metal, ceramic, glass, non-crystalline solid, semiconductor, polymer and/or composite. A surface of the substrate is pretreated before the step of depositing. Pretreatment comprises depositing a material on portion(s) of the surface, oxidizing portion(s) of the surface and/or etching portion(s) of the surface. The deposition step comprises chemical vapor deposition, metal oxide chemical vapor deposition, sputtering, sol-gel techniques, evaporation, pulsed laser deposition, ion beam assisted deposition, molecular self assembly, soft lithography, layer by layer deposition or Langmuir Blodgett techniques. The end group is removed. A change in conformation state comprises causing a terminal group of the molecular assembly to bend towards the substrate.

ORGANIC CHEMISTRY - Preferred Components: The monolayer comprises 16-mercaptohexadecanoic acid.

L40 ANSWER 13 OF 14 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN
 ACCESSION NUMBER: 2003-559303 [52] WPIX
 DOC. NO. CPI: C2003-150813 [52]
 DOC. NO. NON-CPI: N2003-444606 [52]
 TITLE: Functional element, useful e.g. for analyte detection and controlling cell growth, comprises nanoparticles immobilized on a surface and having specific-binding properties
 DERWENT CLASS: A89; B04; C07; D13; D15; D16; J04; Q68; S03; T01
 INVENTOR: BRUNNER H; HAUSER N; RUPP S; SCHIESTEL T; TOVAR G; WEBER A
 PATENT ASSIGNEE: (FRAU-C) FRAUNHOFER GES FOERDERUNG ANGEWANDTEN; (FRAU-C) FRAUNHOFER GES FOERDERUNG ANGEWANDTEN EV
 COUNTRY COUNT: 101

PATENT INFORMATION:

PATENT NO	KIND DATE	WEEK	LA	PG	MAIN IPC
WO 2003056336	A2 20030710	(200352)*	DE	92[9]	
DE 10164309	A1 20030710	(200355)	DE		
AU 2002358799	A1 20030715	(200421)	EN		
EP 1461619	A2 20040929	(200463)	DE		
US 20050048570	A1 20050303	(200517)	EN		
JP 2005524829	W 20050818	(200555)	JA	41	
AU 2002358799	A8 20051027	(200624)	EN		

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2003056336 A2		WO 2002-EP14769	20021227
DE 10164309 A1		DE 2001-10164309	20011228
AU 2002358799 A1		AU 2002-358799	20021227
EP 1461619 A2		EP 2002-793118	20021227
EP 1461619 A2		WO 2002-EP14769	20021227
US 20050048570 A1		WO 2002-EP14769	20021227
JP 2005524829 W		WO 2002-EP14769	20021227
JP 2005524829 W		JP 2003-556808	20021227
US 20050048570 A1		US 2004-500425	20040907
AU 2002358799 A8		AU 2002-358799	20021227

FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 2002358799	A1 Based on	WO 2003056336 A
EP 1461619	A2 Based on	WO 2003056336 A
JP 2005524829	W Based on	WO 2003056336 A
AU 2002358799	A8 Based on	WO 2003056336 A

PRIORITY APPLN. INFO: DE 2001-10164309 20011228

INT. PATENT CLASSIF.:

MAIN:

IPC RECLASSIF.:

G01N0033-53; G01N0033-543
 B01J0019-00 [I,A]; B01J0019-00 [I,C]; C12N0001-00 [I,A];
 C12N0001-00 [I,C]; C12N0015-09 [I,A]; C12N0015-09 [I,C];
 C12Q0001-04 [I,A]; C12Q0001-04 [I,C]; C12Q0001-68 [I,A];
 C12Q0001-68 [I,C]; G01N0021-25 [I,C]; G01N0021-27 [I,A];
 G01N0021-31 [I,C]; G01N0021-33 [I,A]; G01N0021-64 [I,A];
 G01N0021-64 [I,C]; G01N0027-62 [I,A]; G01N0027-62 [I,C];
 G01N0033-53 [I,A]; G01N0033-53 [I,C]; G01N0033-543 [I,A];
 G01N0033-543 [I,C]; G01N0033-544 [I,C]; G01N0033-545
 [I,A]; G01N0033-547 [I,A]; G01N0033-551 [I,C];
 G01N0033-552 [I,A]; G01N0033-553 [I,A]; G01N0037-00 [I,A]
 ; G01N0037-00 [I,C]

ECLA:

ICO:

B01J0019-00C; G01N0033-543D6; G01N0033-543M
 L01J0219:00C2D24; L01J0219:00C2D8; L01J0219:00C2H2D;
 L01J0219:00C2L8; L01J0219:00C4L12; L01J0219:00C4L2;
 L01J0219:00C4L3D; L01J0219:00C4L4B; L82T0201:01;
 M40B0060:14; Y01N0006:00

USCLASS NCLM:

NCLS:

435/007.100
 435/287.200

JAP. PATENT CLASSIF.:

MAIN/SEC.:

C12N0001-00; C12N0015-00 A; C12Q0001-04; C12Q0001-68 A;
 G01N0021-27 Z; G01N0021-33; G01N0021-64 Z; G01N0027-62 V;
 G01N0033-53 D; G01N0033-53 M; G01N0033-543 501 J;
 G01N0033-543 521; G01N0033-543 525 U; G01N0033-545 Z;
 G01N0033-547; G01N0033-552; G01N0033-553; G01N0037-00 102
 2G041; 2G043; 2G045; 2G058; 2G059; 4B024; 4B063; 4B065;
 4B065/AA01.X; 2G043/AA03; 2G059/AA05; 4B024/AA11;
 4B065/AA57.X; 4B065/AA83.X; 4B065/AA86.X; 4B065/AA87.X;
 4B065/AA95.X; 4B065/AC20; 2G043/BA16; 2G059/BB12;
 4B065/BC42; 2G041/CA01; 2G043/CA04; 4B024/CA04;
 4B024/CA05; 4B024/CA06; 4B024/CA09; 4B065/CA46;
 2G059/CC16; 2G043/DA01; 2G041/DA04; 2G059/DD01;
 2G043/EA01; 2G041/EA11; 2G043/EA13; 2G059/EE01;
 2G059/EE07; 2G059/EE12; 2G043/FA02; 2G041/FA11;
 2G041/FA12; 2G059/FF03; 2G041/GA06; 2G043/GA07;
 2G043/GB02; 4B024/HA08; 4B024/HA12; 4B024/HA14;

2G059/HH02; 2G059/HH03; 2G041/JA08; 2G041/JA09;
 2G059/JJ01; 2G059/JJ11; 2G043/KA02; 2G043/KA03;
 2G059/KK01; 2G043/LA01; 2G059/NN01; 4B063/QA01;
 4B063/QA17; 4B063/QA18; 4B063/QA19; 4B063/QQ05;
 4B063/QQ16; 4B063/QQ18; 4B063/QQ19; 4B063/QQ42;
 4B063/QQ53; 4B063/QR08; 4B063/QR14; 4B063/QR32;
 4B063/QR42; 4B063/QR50; 4B063/QR66; 4B063/QR69;
 4B063/QR82; 4B063/QS10; 4B063/QS12; 4B063/QS24;
 4B063/QS25; 4B063/QS28; 4B063/QS34; 4B063/QS36;
 4B063/QS39; 4B063/QX01; 4B063/QX04; 4B063/QX10

BASIC ABSTRACT:

WO 2003056336 A2 UPAB: 20060120

NOVELTY - Functional element (A) comprises a carrier having a surface and at least one microstructure (MS), on the surface, where MS consists of individual nanoparticles (NP) which exhibit molecule-specific recognition sites (X) that make MS addressable.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for preparation of (A) by applying to the carrier surface first a layer of at least one binding agent and then NP.

USE - (A) are useful:

(i) in detection processes (mass spectrometry, fluorescence or UV/vis spectrometry, fluorescent or light microscopy, wave-guide or impedance spectrometry and other electrical methods);

(ii) for controlling adhesion and growth of cells;

(iii) for detection/isolation of biomolecules, e.g. interacting proteins;

(iv) for development of pharmaceutical preparations, and for assessing their effects and side-effects;

(v) for diagnosis of diseases, e.g. identification of pathogens or mutated genes, in humans or animals;

(vi) to analyze microbial contamination of samples (water, soil, food and animal fodder); and

(vii) as electrical components in a biocomputer.

ADVANTAGE - In (A), biomolecules are immobilized with retention of activity and at high density. NP are morphologically and chemically stable for a long time in solution; provide a very high surface area:volume ratio and make possible a degree of miniaturization not previously achieved.

MANUAL CODE:

CPI: A12-L04B; A12-W11L; B04-B04C; B04-C01; B04-C02C;
 B04-C03; B04-E01; B04-E10; B04-G01; B04-H01; B04-K01;
 B04-L01; B04-N04; B05-A01B; B05-A02; B05-A03B; B05-B02A3;
 B05-B02C; B06-F03; B10-E04C; B11-C07A; B11-C07B1;
 B11-C07B2; B11-C07B3; B11-C08A; B12-K04A; B12-K04E;
 B12-K04F; C04-B04C; C04-C01; C04-C02C; C04-C03; C04-E01;
 C04-E10; C04-G01; C04-H01; C04-K01; C04-L01; C04-N04;
 C05-A01B; C05-A02; C05-A03B; C05-B02A3; C05-B02C;
 C06-F03; C10-E04C; C11-C07A; C11-C07B1; C11-C07B2;
 C11-C07B3; C11-C08A; C12-K04A; C12-K04E; C12-K04F;
 D05-A02; D05-H09; D05-H11; D05-H12; J04-B01A
 EPI: S03-E14H4; T01-E05D

TECH

INSTRUMENTATION AND TESTING - Preferred Element: MS covers a flat region of the surface and at least one face-length dimension of the coated region is 10 nm to 999 microns. The surface may be planar or prestructured and carries a layer of a compound that inhibits non-specific attachment of biomolecules. Optionally a layer of binding agent (BA) is present between the surface and MS, e.g. a polymer with charged or uncharged reactive groups, especially a hydrogel; a plasma layer (with similar reactive groups), or a silane- or thiol-based self-assembled monolayer. BA can be switched on or off by alterations in pH, ion concentration or temperature.

Preparation: One or more MS are applied using a needle-ring printer; by lithography (especially photo- or micro-pen- lithography); by ink-jet methods or by micro-contact printing. The surface may be cleaned and/or activated (chemically or by deposition of electrical charges) before application of BA, especially by applying a primer and, after application of BA, it is dipped into a suspension of NP. BA may also be applied by dipping so that the entire surface is treated. Biologically active molecules are attached to (X) before and/or after deposition of NP on the surface.

Preferred Materials: The carrier and/or surface is made of metal (oxide), polymer, semiconductor, glass and/or ceramic. NP consist of a core (organic polymer or inorganic material, preferably of diameter 5-500 nm) and its surface carries (X), covalently or non-covalently linked to one or more biologically active molecules so that these retain their biological activity. The core may include an additional function, e.g. a fluorescent, UV/visible or radioactive marker, or a superparamagnetic or ferromagnetic function. In this case, the core is modified with an (in)organic layer containing reactive groups and exhibiting the second function. The core surface may also be contain a compound that provides steric stabilization; inhibition of conformational change in immobilized molecules and/or inhibition of binding of additional biomolecules. The bound molecules are labeled and/or have further molecules bound to them. The MS consists of one or more layers of NP, and different NP carry different (X).

BIOLOGY - Preferred Materials: Materials bound to (X) are proteins (especially antibodies, antigens, enzymes, cytokines or receptors), nucleic acids or peptide nucleic acids, or their fragments. Particularly (X) and the bound molecules contain complementary reactive groups, e.g. reactive ester, aldehyde, amino, carboxy, epoxy, oligohistidine, metal chelate, biotin, streptavidin etc. Both function groups may be present in a spacer, or attached through a spacer.

POLYMERS - Preferred Materials: Suitable polymers for the core of NP are polypropylene, polystyrene and/or polyacrylate. The material that provides steric stabilization etc. is a poly- or oligo-ethylene glycol and/or dextran.

INORGANIC CHEMISTRY - Preferred Materials: Suitable materials for the core of NP include metals (gold, silver or nickel); silicon or its oxides; silicates; alumina; zeolites; indium-tin oxide, hydroxylapatite etc.

ABEX EXAMPLE - Silica particles (mean diameter 125 nm) were prepared by hydrolysis of tetraethoxysilane with ammonia in ethanol. Separately, a silicon carrier was treated with 2wt.% Hellmanex (RTM) solution at 40 degrees Centigrade; then rinsed and dried; hydroxylated with ammonia/hydrogen peroxide and incubated for 20 minutes with a solution of poly(diallyldimethylammonium chloride). It was washed and dried again, then the suspension of silica particles applied to the treated surface using a commercial ring/pin microarrayer, to form 150-200 micron diameter dots a few microns apart. When the suspension was applied once or twice, distribution of particles over the dot was uniform, but if many (10) applications were made, the particles concentrated at the edge of the dot.

L40 ANSWER 14 OF 14 WPIX COPYRIGHT 2009 THOMSON REUTERS ON STN
 ACCESSION NUMBER: 2001-308300 [32] WPIX
 CROSS REFERENCE: 1993-406102; 2000-686478; 2002-224757; 2002-371471;
 2003-220243; 2005-402422
 DOC. NO. CPI: C2001-095244 [32]
 DOC. NO. NON-CPI: N2001-220629 [32]
 TITLE: Electronic device for memory applications comprises two
 or more contacts and monolayer of conductive organic
 material forming conductive path including electron
 withdrawing group(s) between contacts
 DERWENT CLASS: E19; L03; P73; U14

11/594654

INVENTOR: CHEN J; PRICE D W; RAWLETT A M; REED M A; TOUR J M
 PATENT ASSIGNEE: (UYA-C) UNIV YALE
 COUNTRY COUNT: 94

PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
WO 2001027972	A2	20010419	(200132)*	EN	47	[20]
AU 2001032614	A	20010423	(200147)	EN		
TW 463183	A	20011111	(200248)	ZH		
JP 2004518268	W	20040617	(200440)	JA	124	
US 6756605	B1	20040629	(200443)	EN		
EP 1542869	A2	20050622	(200541)	EN		

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2001027972	A2	WO 2000-US25518	20000918
US 6756605	B1 Provisional	US 1999-154716P	19990920
US 6756605	B1 Provisional	US 1999-157149P	19990930
US 6756605	B1 CIP of	US 2000-527885	20000320
US 6756605	B1	US 2000-551716	20000418
EP 1542869	A2	EP 2000-991376	20000918
JP 2004518268	W	WO 2000-US25518	20000918
EP 1542869	A2	WO 2000-US25518	20000918
TW 463183	A	TW 2000-119232	20001216
AU 2001032614	A	AU 2001-32614	20000918
JP 2004518268	W	JP 2001-530895	20000918

FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 2001032614	A	Based on
JP 2004518268	W	Based on
EP 1542869	A2	Based on
		WO 2001027972 A
		WO 2001027972 A
		WO 2001027972 A

PRIORITY APPLN. INFO: US 2000-551716 20000418
 US 1999-154716P 19990920
 US 1999-157149P 19990930
 US 2000-527885 20000320

INT. PATENT CLASSIF.:

MAIN: H01B003-18; H01L051-00
 SECONDARY: H01L027-10
 IPC RECLASSIF.: G11C0013-02 [I,A]; G11C0013-02 [I,C]; H01L0027-10 [I,A];
 H01L0027-10 [I,C]; H01L0027-28 [I,A]; H01L0027-28 [I,C];
 H01L0051-05 [I,A]; H01L0051-05 [I,C]
 ECLA: G11C0013-02; H01L0051-00T
 ICO: L82T0201:01; Y01N0004:00; Y01N0006:00
 USCLASS NCLM: 257/040.000
 NCLS: 257/041.000; 977/936.000
 JAP. PATENT CLASSIF.:
 MAIN/SEC.: H01L0027-10 449; H01L0027-10 451; H01L0029-28
 FTERM CLASSIF.: 5F083; 5F096; 5F083/FZ07; 5F083/JA19; 5F083/JA37;
 5F083/JA38; 5F083/JA39; 5F083/JA60

BASIC ABSTRACT:

WO 2001027972 A2 UPAB: 20080523

NOVELTY - An electronic device comprises two or more contacts and a monolayer of conductive organic material forming a conductive path including electron withdrawing group(s) between the contacts.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for:

(1) an electronic device comprises two or more contacts at least one being palladium and a self assembled monolayer of a conductive organic molecule comprising phenyl-ethynyl-substituted phenyl-ethynyl- phenyl linkage between the contacts, the substituted phenyl includes nitro group(s) and the organic molecule is bonded to the palladium contact by isocyano group(s) on the terminal phenyl of the linkage;

(2) a memory circuit comprises:

(a) an input;

(b) an output;

(c) a molecular electronic device as described above where one contact bridges the input and output and another is grounded; and

(d) a comparator (in electrical communication with a reference voltage) bridging the input and output;

(3) a memory array comprises the memory circuits above in an addressable array;

(4) a static random access memory cell comprises at least a first and a second molecular electronic device as described above with the first device connected to a reference voltage and another connected to a node; the second device has one contact connected to ground and another to the node; the node is further connected to ground.

USE - The device is used in memory circuits and arrays and in static random access memory cells (all claimed).

ADVANTAGE - Molecular scale systems offer uniformity of structure, lowered fabrication costs, ease of synthesis and a range of structures.

DESCRIPTION OF DRAWINGS - The drawing shows an embodiment of a molecular scale electronic device.

device (1)

substrate (3)

insulating material (5)

cavity (7)

MANUAL CODE: CPI: E10-B04E; E10-G03; E35-B; E35-X; L03-G04A; L04-C10F;
L04-C11
EPI: U14-A03X

TECH

ELECTRONICS - Preferred Memory Cell: The memory cell (3) further comprises a gain component. Preferred Device: The device has low (current of less than 100 pA, preferably less than 1 pA) and high (more than 200 times higher than low state, preferably more than 1000 times higher) conductivity states and can be repeatedly switched between the two. The device exhibits negative differential resistance at room temperature.

ORGANIC CHEMISTRY - Preferred Electron Withdrawing Group: the electron withdrawing group is from cyano, isocyano, nitro, sulfonyl, beta-carboxyvinyl, sulfinyl, beta,beta-dicyanovinyl, halogenated alkyl, formyl, carboxyl, carbonyl, alkyl/aryl-oxycarbonyl, 1-tetrazoyl, 5-chloro-1-tetrazoyl, carbamoyl and sulfamoyl (cyano, isocyano, nitro). The group is bonded to a phenyl ring in the conductive path.

Preferred Device: The device further contains electron donating group(s). The conductive path comprises atoms, at least 70% of which are sp- or sp²-hybridized and comprises alternating ethyl and aryl groups with at least one phenyl-ethynyl linkage. At least one phenyl group is substituted with an electron withdrawing group. the conductive path further comprises binding groups (S/O atoms, cyano, carboxy, diazonium salt, halide, isocyano, phosphine, Te/Se atoms) which bind it to the contacts. The conductive path comprises biphenyl and/or ethenyl groups.

ABEX EXAMPLE - Devices were fabricated using low pressure chemical vapor

deposition of Si₃N₄ onto a silicon (100) wafer, optically etched on one side to remove a 400 x 400 microm square of nitride. The exposed silicon was etched with KOH until only a 40 x 40 microm silicon nitride membrane was left, a 30 - 50 nm hole was made in this by electron beam lithography and reactive ion etching. A metallic gold contact 200 nm thick was evaporated onto the topside of the membrane filling the pore with gold. The sample was immediately transferred to a solution of 2'-amino-4-ethylphenyl-4'-ethynylphenyl-5'-nitro-1-(thioacetyl)benzene (0.5 mM in THF) and ammonium hydroxide (5 microL per mg of (thioacetyl)benzene) for the self assembly to cover over 48 hours under argon. A bottom gold electrode was then evaporated onto the device under vacuum with at 77K and a rate of less than 1 Angstrom per second. the devices were diced into individual chips. The current/voltage plot (60K) for this device shows a peak of 1.03 nA at 2V with the current being near zero at other voltages. The peak voltage position and current peak magnitude varies with temperature.

=> d his 146

(FILE 'HCAPLUS' ENTERED AT 15:22:08 ON 28 OCT 2009)
L46 16 S L32 NOT L45

FILE 'STNGUIDE' ENTERED AT 15:22:37 ON 28 OCT 2009

FILE 'WPIX' ENTERED AT 15:23:27 ON 28 OCT 2009

FILE 'STNGUIDE' ENTERED AT 15:23:38 ON 28 OCT 2009

=> d que 146

L7 942 SEA FILE=HCAPLUS ABB=ON PLU=ON SURFACE(W)MODIF? (3A) LAYER?
L8 18364 SEA FILE=HCAPLUS ABB=ON PLU=ON ((SELF(W)ASSEMBL?)(W)
(MONOLAYER# OR MONO(W)LAYER#))
L9 14707 SEA FILE=HCAPLUS ABB=ON PLU=ON "SAM"
L10 1828847 SEA FILE=HCAPLUS ABB=ON PLU=ON PHENYL OR BIPHENYL OR
TERPHENYL
L11 70335 SEA FILE=HCAPLUS ABB=ON PLU=ON ANTHRACYL OR NAPHTHYL OR
BIPYRIDYL OR TERPYRIDYL
L12 6620 SEA FILE=HCAPLUS ABB=ON PLU=ON THIOPHENYL OR BITHIENYL OR
TERTHIENYL OR PYRROLYL
L13 12 SEA FILE=HCAPLUS ABB=ON PLU=ON (BI OR TRI)(W) CYCLOALKANE#
OR TETRA(W)CYCLOALKANE#
L19 245508 SEA FILE=HCAPLUS ABB=ON PLU=ON ARYL
L20 21238 SEA FILE=HCAPLUS ABB=ON PLU=ON ALICYCLIC
L21 165 SEA FILE=HCAPLUS ABB=ON PLU=ON (L8 OR L9) AND (L19 OR L20)
L23 69 SEA FILE=HCAPLUS ABB=ON PLU=ON L21 AND 66/SC, SX
L24 1 SEA FILE=HCAPLUS ABB=ON PLU=ON L23 AND L7
L25 4 SEA FILE=HCAPLUS ABB=ON PLU=ON L23 AND (SURFACE(W)MODIF?)
L26 8 SEA FILE=HCAPLUS ABB=ON PLU=ON L21 AND LITHOGRAPH?
L27 10 SEA FILE=HCAPLUS ABB=ON PLU=ON (L24 OR L25 OR L26)
L28 46 SEA FILE=HCAPLUS ABB=ON PLU=ON L21 AND ((L10 OR L11 OR L12
OR L13))
L30 9 SEA FILE=HCAPLUS ABB=ON PLU=ON L28 AND (SURFAC?) (2A)
(TRANSIT? OR MODIF? OR PATTERN?)
L31 17 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 OR L30
L32 17 SEA FILE=HCAPLUS ABB=ON PLU=ON L31 AND (L8 OR L9)
L45 18 SEA FILE=WPIX ABB=ON PLU=ON (WO2002-EP14769/AP OR WO2005-GB11
59/AP OR US2001-350090P/AP OR US2002-284794/AP OR WO2000-US2551
8/AP OR AU2002-321990/AP OR AU2002-358799/AP OR AU2002-365147/A
P OR AU2002-367538/AP OR AU2002321990/PN OR AU2002358799/PN OR
AU2002365147/PN OR AU2002367538/PN OR AU2003-233579/AP OR
AU2003233579/PN OR CN2005-10087971/AP OR GB2006-18673/AP OR
GB2426724/AP OR US2002-381913P/AP OR US2003-441965/AP OR
WO2002-US34970/AP OR WO2002-US35134/AP OR WO2003-US15757/AP OR
WO2005-US8850/AP OR WO2005089415/PN OR WO2007-US19894/AP OR
WO2008108809/PN OR AU2001-32614/AP OR AU2001032614/PN OR
"CN100539201 C"/PN OR CN1734792/PN OR CN1958301/PN OR CN2006-10
143605/AP OR DE10164309/PN OR DE2001-10164309/AP OR EP1441695/P
N OR EP1461619/PN OR EP1509336/PN OR EP1542869/PN OR EP1630883/
PN OR EP1782886/PN OR EP2000-991376/AP OR EP2002-793118/AP OR
EP2002-803299/AP OR EP2003-729016/AP OR EP2005-23880/AP OR
EP2005-254258/AP OR JP2001-530895/AP OR JP2003-556808/AP OR
JP2004518268/PN OR JP2005-216748/AP OR JP2005524829/PN OR
JP2006049890/PN OR JP2007-274254/AP OR JP2008183702/PN OR
KR2007-8357/AP OR KR825176/PN OR TW2000-119232/AP OR TW463183/P
N OR US1999-154716P/AP OR US1999-157149P/AP OR US2000-527885/AP

OR US2000-551716/AP OR US2001-335165P/AP OR US2001-864384/AP
 OR US2002-287935/AP OR US2002-307069/AP OR US20020177083/PN OR
 US2003-421355/AP OR US20030142901/PN OR US2004-494122/AP OR
 US2004-500425/AP OR US2004-555770P/AP OR US2004-900624/AP OR
 US20040014186/PN OR US20040087177/PN OR US20040102050/PN OR
 US2005-83739/AP OR US20050048570/PN OR US20050221081/PN OR
 US20050227232/PN OR US2006-390405/AP OR US2006-477655/AP OR
 US2006-594654/AP OR US20060021647/PN OR US20060263033/PN OR
 US2007-757018/AP OR US20070098899/PN OR US20070140901/PN OR
 US20080182072/PN OR US6586158/PN OR US6756605/PN OR US6893966/P
 N OR US7020355/PN OR US7381789/PN OR WO2001027972/PN OR
 WO2002-US3885/AP OR WO2002095787/PN OR WO2003055590/PN OR
 WO2003056336/PN OR WO2003076082/PN OR WO2003099465/PN OR
 WO2005092516/PN)

L46 16 SEA FILE=HCAPLUS ABB=ON PLU=ON L32 NOT L45

=> d his 144

(FILE 'EMA, COMPENDEX, INSPEC, SCISEARCH, PASCAL, JAPIO' ENTERED AT
 15:18:20 ON 28 OCT 2009)

L44 11 S L42 OR L43

=> d que 144

L8 18364 SEA FILE=HCAPLUS ABB=ON PLU=ON ((SELF(W)ASSEMBL?)(W)
 (MONOLAYER# OR MONO(W)LAYER#))
 L9 14707 SEA FILE=HCAPLUS ABB=ON PLU=ON "SAM"
 L10 1828847 SEA FILE=HCAPLUS ABB=ON PLU=ON PHENYL OR BIPHENYL OR
 TERPHENYL
 L11 70335 SEA FILE=HCAPLUS ABB=ON PLU=ON ANTHRACYL OR NAPHTHYL OR
 BIPYRIDYL OR TERPYRIDYL
 L12 6620 SEA FILE=HCAPLUS ABB=ON PLU=ON THIOPHENYL OR BITHIENYL OR
 TERTHIENYL OR PYRROLYL
 L13 12 SEA FILE=HCAPLUS ABB=ON PLU=ON (BI OR TRI)(W) CYCLOALKANE#
 OR TETRA(W)CYCLOALKANE#
 L34 258 SEA FILE=WPIX ABB=ON PLU=ON (L8 OR L9) AND ((L10 OR L11 OR
 L12 OR L13))
 L35 14 SEA FILE=WPIX ABB=ON PLU=ON L34 AND LITHOGRAPH?
 L41 102 SEA L35
 L42 11 SEA L41 AND (SURFAC?) (2N) (TRANSIT? OR MODIF? OR PATTERN?)
 L43 1 SEA L41 AND (ARYL OR HETERO(W) ARYL OR ALICYCLIC OR HETERO(W)
 CYCLIC)
 L44 11 SEA L42 OR L43

=> dup rem 146 144

FILE 'HCAPLUS' ENTERED AT 15:24:08 ON 28 OCT 2009
 USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
 PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
 COPYRIGHT (C) 2009 AMERICAN CHEMICAL SOCIETY (ACS)

FILE 'COMPENDEX' ENTERED AT 15:24:08 ON 28 OCT 2009
 Compendex Compilation and Indexing (C) 2009
 Elsevier Engineering Information Inc (EEI). All rights reserved.
 Compendex (R) is a registered Trademark of Elsevier Engineering Information Inc.

FILE 'INSPEC' ENTERED AT 15:24:08 ON 28 OCT 2009
 Compiled and produced by the IET in association WITH FIZ KARLSRUHE
 COPYRIGHT 2009 (c) THE INSTITUTION OF ENGINEERING AND TECHNOLOGY (IET)

FILE 'SCISEARCH' ENTERED AT 15:24:08 ON 28 OCT 2009
Copyright (c) 2009 The Thomson Corporation

FILE 'PASCAL' ENTERED AT 15:24:08 ON 28 OCT 2009
Any reproduction or dissemination in part or in full,
by means of any process and on any support whatsoever
is prohibited without the prior written agreement of INIST-CNRS.
COPYRIGHT (C) 2009 INIST-CNRS. All rights reserved.
PROCESSING COMPLETED FOR L46
PROCESSING COMPLETED FOR L44
L47 22 DUP REM L46 L44 (5 DUPLICATES REMOVED)
ANSWERS '1-16' FROM FILE HCAPLUS
ANSWER '17' FROM FILE COMPENDEX
ANSWERS '18-19' FROM FILE INSPEC
ANSWERS '20-22' FROM FILE SCISEARCH

=> d 147 1-16 ibib abs hitind; d 147 17-22 ibib ab ind

L47 ANSWER 1 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN DUPLICATE 1
ACCESSION NUMBER: 2008:1207298 HCAPLUS Full-text
DOCUMENT NUMBER: 149:425412
TITLE: Micrometer and Nanometer Scale Patterning Using the
Photo-Fries Rearrangement: Toward Selective Execution
of Molecular Transformations with Nanoscale Spatial
Resolution
AUTHOR(S): Griesser, Thomas; Adams, Joseph; Wappel, Julia; Kern,
Wolfgang; Leggett, Graham J.; Trimmel, Gregor
CORPORATE SOURCE: Institute for Chemistry and Technology of Materials
(ICTM), Graz University of Technology, Graz, 8010,
Austria
SOURCE: Langmuir (2008), 24(21), 12420-12425
CODEN: LANGD5; ISSN: 0743-7463
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 149:425412

AB The photolithog. modification of monolayers provides a versatile and powerful means of fabricating functionalized nanostructured surfaces. In this contribution, we present photosensitive thiol-bearing aryl ester groups which are capable of undergoing the so-called photo-Fries rearrangement to yield hydroxy ketones. Ph 16-mercaptohexadecanoate was prepared by a three-step synthesis. This mol. undergoes a photoisomerization reaction upon illumination with UV light at ca. 250 nm. Subsequently this mol. was applied as a self-assembled monolayer on gold. Following photochem. modification, the adsorbates were selectively derivatized to yield amino-functionalized surfaces using a simple two-step reaction. This reaction was monitored by XPS and contact angle measurements and friction force microscopy. Micrometer-scale patterned surfaces were produced using a contact mask in conjunction with a frequency-doubled argon ion laser ($\lambda = 244$ nm). Near-field optical exposure was carried out by coupling the laser to a scanning near-field optical microscope and yielded nanometer-scale resolution. Following derivatization, the resulting structures were analyzed by friction force microscopy. Clear contrast was observed in the friction signal following surface modification. Safety: caution is recommended with UV irradiation, especially with UV lasers. Safety: Piranha solution reacts violently with organic materials.
CC 22-6 (Physical Organic Chemistry)
Section cross-reference(s): 66, 74
IT Adsorbed monolayers
Chemoselectivity

- (chemoselective photo-Fries rearrangement of adsorbed Ph 16-mercaptohexadecanoate not accompanied by thiol headgroup photooxidn.)
- IT Shadow masks
(for micro-scale photolithog.; chemoselective photo-Fries rearrangement of adsorbed Ph 16-mercaptohexadecanoate not accompanied by thiol headgroup photooxidn.)
- IT Scanning probe microscopy
(frictional-force, for analyzing micro- and nanopatterned monolayers; chemoselective photo-Fries rearrangement of adsorbed Ph 16-mercaptohexadecanoate not accompanied by thiol headgroup photooxidn.)
- IT Self-assembled monolayers
(micro- and nanoscale patterning using the photo-Fries rearrangement of self-assembled monolayers of Ph 16-mercaptohexadecanoate)
- IT Photolithography
(micro- and nanoscale; chemoselective photo-Fries rearrangement of adsorbed Ph 16-mercaptohexadecanoate not accompanied by thiol headgroup photooxidn.)
- IT Lithography
(nano-; chemoselective photo-Fries rearrangement of adsorbed Ph 16-mercaptohexadecanoate not accompanied by thiol headgroup photooxidn.)
- IT Nanostructures
(nanostructure fabrication using photo-Fries rearrangement; chemoselective photo-Fries rearrangement of adsorbed Ph 16-mercaptohexadecanoate not accompanied by thiol headgroup photooxidn.)
- IT Microscopes
(near-field, scanning, used for nanostructure patterning; chemoselective photo-Fries rearrangement of adsorbed Ph 16-mercaptohexadecanoate not accompanied by thiol headgroup photooxidn.)
- IT Contact angle
(of water (sessile drop) as function of SAM modification; micro- and nanoscale patterning using the photo-Fries rearrangement of self-assembled monolayers of Ph 16-mercaptohexadecanoate)
- IT Fries rearrangement
(photochem.; micro- and nanoscale patterning using the photo-Fries rearrangement of self-assembled monolayers of Ph 16-mercaptohexadecanoate)
- IT 1064082-12-7DP, gold surface-adsorbed
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(amino-terminated SAM; micro- and nanoscale patterning using the photo-Fries rearrangement of self-assembled monolayers of Ph 16-mercaptohexadecanoate)
- IT 506-13-8, 16-Hydroxyhexadecanoic acid
RL: RCT (Reactant); RACT (Reactant or reagent)
(bromination; micro- and nanoscale patterning using the photo-Fries rearrangement of self-assembled monolayers of Ph 16-mercaptohexadecanoate)
- IT 108-95-2, Phenol, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(esterification; micro- and nanoscale patterning using the photo-Fries rearrangement of self-assembled monolayers of Ph 16-mercaptohexadecanoate)
- IT 2536-35-8P, 16-Bromohexadecanoic acid

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
 (esterification; micro- and nanoscale patterning using the photo-Fries rearrangement of self-assembled monolayers of Ph 16-mercaptohexadecanoate)

IT 12033-89-5, Silicon nitride, uses
 RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (friction force microscopic probe; micro- and nanoscale patterning using the photo-Fries rearrangement of self-assembled monolayers of Ph 16-mercaptohexadecanoate)

IT 1064082-11-6DP, gold surface-adsorbed
 RL: RCT (Reactant); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
 (hydroxy ketone SAM, post-illumination modification with polar amino groups; micro- and nanoscale patterning using the photo-Fries rearrangement of self-assembled monolayers of Ph 16-mercaptohexadecanoate)

IT 107-15-3, Ethylenediamine, reactions 111-50-2, Adipoyl chloride
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (post-illumination modification agent; micro- and nanoscale patterning using the photo-Fries rearrangement of self-assembled monolayers of Ph 16-mercaptohexadecanoate)

IT 7440-57-5, Gold, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (substrate; micro- and nanoscale patterning using the photo-Fries rearrangement of self-assembled monolayers of Ph 16-mercaptohexadecanoate)

IT 1064082-06-9DP, Phenyl 16-mercaptohexadecanoate, gold surface-adsorbed
 RL: RCT (Reactant); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
 (target aryl ester SAM, photolysis; micro- and nanoscale patterning using the photo-Fries rearrangement of self-assembled monolayers of Ph 16-mercaptohexadecanoate)

IT 1064082-06-9P, Phenyl 16-mercaptohexadecanoate
 RL: PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
 (target aryl ester, surface adsorption; micro- and nanoscale patterning using the photo-Fries rearrangement of self-assembled monolayers of Ph 16-mercaptohexadecanoate)

IT 1064082-05-8P, Phenyl 16-bromohexadecanoate
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
 (thiolation; micro- and nanoscale patterning using the photo-Fries rearrangement of self-assembled monolayers of Ph 16-mercaptohexadecanoate)

OS.CITING REF COUNT: 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (3 CITINGS)

REFERENCE COUNT: 54 THERE ARE 54 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 2 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2005:453718 HCAPLUS Full-text
 DOCUMENT NUMBER: 142:492259

TITLE: Field-assisted micro- and nano-fabrication method
 INVENTOR(S): Huang, Wen C.; Jang, Bor Z.
 PATENT ASSIGNEE(S): USA
 SOURCE: U.S. Pat. Appl. Publ., 12 pp.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20050112505	A1	20050526	US 2003-720891	20031125
PRIORITY APPLN. INFO.:			US 2003-720891	20031125

OTHER SOURCE(S): MARPAT 142:492259

AB It is an object of the present invention to provide an improved micro- or nanolithog. method for creating submicrometer or nanometer-size self-assembled monolayers with controlled orientations. A direct-write micro- or nanolithog. method for depositing a functional material with a preferred orientation onto a target surface. The method includes the steps of (1) forming a precursor fluid to the functional material; (2) operating a sub-micrometer tip to discharge, on contact, the precursor fluid onto the target surface so as to produce a desired pattern of deposited functional material in sub-micrometer dimensions; and (3) during the pattern-producing step, subjecting the deposited material to a highly localized elec. or magnetic field for attaining a preferred orientation in at least a portion of the functional material. The method is particularly useful for microfabrication, nanotechnol., and mol. electronics.

IC ICM G03F007-16

INCL 430315000; 430935000

CC 76-14 (Electric Phenomena)

Section cross-reference(s): 48, 74, 77

IT Thiols, processes

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(aryl; field-assisted micro-fabrication and nano-fabrication method)

IT Antiferromagnetic materials

Conducting polymers

Controlled atmospheres

Electric field effects

Electronic device fabrication

Ferrimagnetic materials

Ferroelectric materials

Ferromagnetic materials

Fluids

Liquid crystals

Lithography

Magnetic field effects

Molecular electronic devices

Nanomachines

Nonlinear optical materials

Nozzles

Optical fibers

Piezoelectric materials

Pyroelectric substances

Self-assembled monolayers

Vacuum

(field-assisted micro-fabrication and nano-fabrication method)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD
(1 CITINGS)

L47 ANSWER 3 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2005:945241 HCAPLUS Full-text

DOCUMENT NUMBER: 143:346764

TITLE: Spatially Resolved Suzuki Coupling Reaction Initiated and Controlled Using a Catalytic AFM Probe

AUTHOR(S): Davis, Jason J.; Coleman, Karl S.; Busuttill, Katerina L.; Bagshaw, Claire B.

CORPORATE SOURCE: Inorganic Chemistry Department Central Research Laboratory, Oxford University, Oxford, OX1 3TA, UK

SOURCE: Journal of the American Chemical Society (2005), 127(38), 13082-13083

CODEN: JACSAT; ISSN: 0002-7863

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 143:346764

AB Appropriately modified proximal probes can be utilized in the spatially resolved chemical coupling of surface-bound and solution-phase reagents. Herein we report a chemical specific Suzuki coupling reaction between a surface-confined aryl bromide and boronic acid reagents in solution achieved using a catalytic AFM probe.

CC 22-13 (Physical Organic Chemistry)

Section cross-reference(s): 66, 67

IT Lithography

(scanning probe; spatially resolved Suzuki coupling reaction initiated and controlled using a catalytic AFM probe)

IT Self-assembled monolayers

Surface reaction

Suzuki coupling reaction

Suzuki coupling reaction catalysts

(spatially resolved Suzuki coupling reaction initiated and controlled using a catalytic AFM probe)

IT 866006-10-2P

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)

(preparation, characterization, and Suzuki coupling reaction as self-assembled monolayer on gold; spatially resolved

Suzuki coupling reaction initiated and controlled using a catalytic AFM probe)

OS.CITING REF COUNT: 10 THERE ARE 10 CAPLUS RECORDS THAT CITE THIS RECORD (10 CITINGS)

REFERENCE COUNT: 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 4 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2005:189321 HCAPLUS Full-text

TITLE: Patterned reduction of aryl-azide terminated self-assembled monolayers

photocatalyzed by CdS or CdSe quantum dots

AUTHOR(S): Radhakrishnan, Chander; Lo, Michael K. F.; Garcia-Garibay, Miguel; Monbouquette, Harold

CORPORATE SOURCE: Department of Chemical Engineering, University of California, Los Angeles, Los Angeles, CA, 90095-1592, USA

SOURCE: Abstracts of Papers, 229th ACS National Meeting, San Diego, CA, United States, March 13-17, 2005 (2005),

COLL-621. American Chemical Society: Washington, D. C.
 CODEN: 69GQMP

DOCUMENT TYPE: Conference; Meeting Abstract

LANGUAGE: English

AB We recently reported that thiolamine-capped CdS and CdSe quantum dots (Qdots) effectively photocatalyze the reduction of aryl azides to aryl amines in solution. The corresponding surface reaction also has been demonstrated using aryl-azide terminated self-assembled monolayers (SAMs) on evaporated gold. The SAMs were characterized fully, before and after photocatalysis, by XPS, contact angle measurements and FTIR. The Qdots adsorb strongly to the aryl-azide terminated SAMs, which facilitates the photocatalyzed reaction. However, subsequent Qdot desorption from the SAM could not be accomplished by sonication in solns. at high or low pH, or at high salt concentration (2M KCl), which suggests that something other than a charge-dipole interaction governs Qdot adsorption. Interestingly, 6M guanidineHCl treatment effected removal of adsorbed Qdots. Reversible Qdot adsorption to aryl-azide SAMs before and after photocatalysis enabled the creation of surface patterns observable with a fluorescence microscope.

L47 ANSWER 5 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2005:348430 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 144:157459

TITLE: Mapping molecular orientation of pentacene on patterned Au surface

AUTHOR(S): Hsu, Y. J.; Hu, W. S.; Wei, D. H.; Wu, Y. S.; Tao, Y. T.

CORPORATE SOURCE: National Synchrotron Radiation Research Center, Hsinchu, 30076, Taiwan

SOURCE: Journal of Electron Spectroscopy and Related Phenomena (2005), 144-147, 401-404

CODEN: JESRAW; ISSN: 0368-2048

PUBLISHER: Elsevier B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB With a photoemission electron microscope, the authors studied the orientation of pentacene films deposited on Au surface that was patterned with self-assembled monolayers (SAMs). Organic thiols $X(CH_2)_nSH$ with $X = -COOH$ or $-Me$ and an aromatic thiol; served as alignment layers to control the orientation of pentacene mols. thermally deposited on top of the SAM. According to the PEEM images and near-edge x-ray absorption fine structure spectra, a SAM exposing a nonpolar Me group, a terphenyl group or a polar carboxyl group all induced perpendicular alignment of the pentacene moiety, in contrast with parallel alignment on a bare Au surface.

CC 66-3 (Surface Chemistry and Colloids)

ST pentacene orientation thiol self assembled monolayer patterned gold surface

IT Thiols, properties

RL: PRP (Properties)

(aryl; mapping mol. orientation of pentacene on Au surface patterned with thiol self-assembled monolayers using photoemission electron microscopy and NEXAFS spectra)

IT Molecular orientation

NEXAFS spectra

Self-assembled monolayers

(mapping mol. orientation of pentacene on Au surface patterned with thiol self-assembled monolayers using photoemission electron microscopy and NEXAFS)

spectra)

IT Thiols, properties
 RL: PRP (Properties)
 (mapping mol. orientation of pentacene on Au surface
 patterned with thiol self-assembled
 monolayers using photoemission electron microscopy and NEXAFS
 spectra)

IT Phenols, properties
 RL: PRP (Properties)
 (thiophenols; mapping mol. orientation of pentacene on Au
 surface patterned with thiol self-
 assembled monolayers using photoemission electron
 microscopy and NEXAFS spectra)

IT 135-48-8, Pentacene 7440-57-5, Gold, properties 78540-82-6,
 [1,1':4',1''-Terphenyl]-4-methanethiol
 RL: PRP (Properties)
 (mapping mol. orientation of pentacene on Au surface
 patterned with thiol self-assembled
 monolayers using photoemission electron microscopy and NEXAFS
 spectra)

OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD
 (2 CITINGS)

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 6 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2004:81557 HCAPLUS Full-text

DOCUMENT NUMBER: 140:287126

TITLE: Synthesis, structural analysis, and self-assembly of
 phenylene ethynylene oligomers and their -F, -CF₃, and
 -CH₃ substituted derivatives

AUTHOR(S): Percec, Simona; Getty, Ross; Marshall, Will; Skidd,
 Gabriel; French, Roger

CORPORATE SOURCE: Experimental Station, Central Research and
 Development, E. I. Du Pont de Nemours and Co.,
 Wilmington, DE, 19880, USA

SOURCE: Journal of Polymer Science, Part A: Polymer Chemistry
 (2004), 42(3), 541-550
 CODEN: JPACEC; ISSN: 0887-624X

PUBLISHER: John Wiley & Sons, Inc.

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 140:287126

AB 4-(2-Arylethynyl)-1-(acetylthio)benzenes 4-(RC.tplbond.C)C6H4SCOCH₃ (I) (R =
 Ph, 4-H₃CC6H₄, 4-FC6H₄, 2-FC6H₄, 4-F₃CC6H₄, 3-F₃CC6H₄) are prepared as
 electrochem. active mols. for incorporation into self- assembled monolayers
 (SAMs). 4-BrC6H₄SCOCH₃ and 4-IC6H₄SCOCH₃ are prepared from 4-
 bromobenzenethiol and 4-iodobenzenesulfonyl chloride, resp.; Sonogashira
 coupling of either 4-BrC6H₄SCOCH₃ or 4-IC6H₄SCOCH₃ to aryl alkynes in the
 presence of bis(dibenzylideneacetone)palladium, copper iodide,
 triphenylphosphine, and triethylamine yields the desired compds. I. SAMs of I
 are prepared; the advancing and receding contact angles, monolayer
 thicknesses, and the differences in surface potential of the SAMs (vs. bare
 gold) are determined The structures of I are determined by X-ray crystallog.
 to understand the properties of SAMs containing I. Unsym. substitution of the
 aromatic rings by electron-active groups in the ortho-, meta-, or para
 positions results in changes in mol. parameters such as bonding and torsion
 angles and planarity. Patterned SAMs of I (R = Ph, 4-FC6H₄) on gold are
 prepared by microcontact printing; the surface potentials of the monolayers
 differed only slightly from that of a bare gold substrate. Unpatterned SAMs

- of I (R = 4-H3CC6H4, 2-FC6H4, 4-F3CC6H4, 3-F3CC6H4) are formed upon incubation of gold substrates with solns. of the thioesters.
- CC 25-7 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
Section cross-reference(s): 66, 75
- ST arylethynylacetylthiobenzene prepn crystal structure; arylethynyl acetylthio benzene prepn crystal structure; phenylene ethynylene oligomer prepn crystal structure self assembled monolayer; contact angle thickness surface potential arylethynylacetylthiobenzene SAM; mol crystal structure arylethynylacetylthiobenzene; surface potential patterned unpatterned SAM arylethynylacetylthiobenzene
- IT Coupling reaction
(Sonogashira; preparation and crystal structures of (arylethynyl)(acetylthio)benzenes by Sonogashira coupling of aryl alkynes and 4-bromo- and 4-iodobenzene thioacetates and the properties of arylalkynylbenzenethiol self-assembled monolayers)
- IT Aromatic hydrocarbons, preparation
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(aryl alkynes; preparation and crystal structures of (arylethynyl)(acetylthio)benzenes by Sonogashira coupling of aryl alkynes and 4-bromo- and 4-iodobenzene thioacetates and the properties of arylalkynylbenzenethiol self-assembled monolayers)
- IT Thiols, preparation
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(aryl, S-acetyl; preparation and crystal structures of (arylethynyl)(acetylthio)benzenes by Sonogashira coupling of aryl alkynes and 4-bromo- and 4-iodobenzene thioacetates and the properties of arylalkynylbenzenethiol self-assembled monolayers)
- IT Alkynes
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(aryl; preparation and crystal structures of (arylethynyl)(acetylthio)benzenes by Sonogashira coupling of aryl alkynes and 4-bromo- and 4-iodobenzene thioacetates and the properties of arylalkynylbenzenethiol self-assembled monolayers)
- IT Contact angle
Ellipsometry
Self-assembled monolayers
Surface potential
(preparation and crystal structures of (arylethynyl)(acetylthio)benzenes by Sonogashira coupling of aryl alkynes and 4-bromo- and 4-iodobenzene thioacetates and the properties of arylalkynylbenzenethiol self-assembled monolayers)
- IT Phenols, preparation
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(thiophenols, S-acetyl; preparation and crystal structures of (arylethynyl)(acetylthio)benzenes by Sonogashira coupling of aryl alkynes and 4-bromo- and 4-iodobenzene thioacetates and the properties of arylalkynylbenzenethiol self-assembled monolayers)
- IT 170159-16-7P 676094-68-1P 676094-69-2P 676094-70-5P 676094-71-6P 676094-72-7P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation and crystal structures of (arylethynyl)(acetylthio)benzenes by

Sonogashira coupling of aryl alkynes and 4-bromo- and 4-iodobenzene thioacetates and the properties of arylalkynylbenzenethiol self-assembled monolayers)

- IT 98-61-3, 4-Iodobenzenesulfonyl chloride 106-53-6, 4-Bromobenzenethiol 536-74-3, Phenylacetylene 705-28-2, 3-(Trifluoromethyl)phenylacetylene 705-31-7, 4-(Trifluoromethyl)phenylacetylene 766-49-4, (2-Fluorophenyl)acetylene 766-97-2, 4-Methylphenylacetylene 766-98-3, 4-Fluorophenylacetylene

RL: RCT (Reactant); RACT (Reactant or reagent)

(preparation and crystal structures of (arylethynyl)(acetylthio)benzenes by Sonogashira coupling of aryl alkynes and 4-bromo- and 4-iodobenzene thioacetates and the properties of arylalkynylbenzenethiol self-assembled monolayers)

- IT 28122-76-1P 52928-01-5P, 4-Iodobenzenethiol 69746-43-6P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation and crystal structures of (arylethynyl)(acetylthio)benzenes by Sonogashira coupling of aryl alkynes and 4-bromo- and 4-iodobenzene thioacetates and the properties of arylalkynylbenzenethiol self-assembled monolayers)

OS.CITING REF COUNT: 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD (4 CITINGS)

REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 7 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2003:445956 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 139:297398

TITLE: On the re-oxidation of silicon(0 0 1) surfaces modified by self-assembled monolayers

AUTHOR(S): Narducci, Dario; Pedemonte, Laura; Bracco, Gianangelo
CORPORATE SOURCE: Istituto Nazionale per la Fisica della Materia, Department of Materials Science, University of Milano Bicocca, Milan, Italy

SOURCE: Applied Surface Science (2003), 212-213, 649-653

CODEN: ASUSEE; ISSN: 0169-4332

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Protection of Si surface toward oxidation represents a relevant issue in view of many microelectronic applications. In 2000, it was shown how mol. grafting with Me groups could efficiently passivate atomically flat Si(1 1 1). However, neither data are currently available on (0 0 1) surfaces nor systematic analyses of the role played by the organic fragment on the protection efficiency were reported yet. The aim of this paper is to present data on the passivation of (0 0 1) Si surface by different aryl fragments self-assembled onto it. Protection was carried out using nucleophilic organic species that were self-assembled on a previously brominated Si surface. Specifically, 5 differently substituted Ph groups were considered. These samples were characterized by specular reflection IR spectroscopy to detect the presence of aryl -terminating groups. The kinetics of the re-oxidation reaction was then monitored over a time period of 2 mo. We found qual. different mechanisms of re-oxidation, depending on the structure of the organic fragment. The first mechanism is compatible with a model where the aryl group simply hinders the surface Si sites, disabling the access of

oxidizing species to the surface itself. The second process appears to be more complex, with the aryl group interacting with the oxidizing species.

CC 66-3 (Surface Chemistry and Colloids)

ST silicon surface oxidn passivation self assembled monolayer

IT Passivation
Self-assembled monolayers
(re-oxidation of Si(0 0 1) surfaces modified by self-assembled monolayers)

IT Oxidation
(surface; re-oxidation of Si(0 0 1) surfaces modified by self-assembled monolayers)

IT 7440-21-3, Silicon, properties
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(re-oxidation of Si(0 0 1) surfaces modified by self-assembled monolayers)

IT 71-43-2, Benzene, uses 85-01-8, Phenanthrene, uses 100-66-3, Anisole, uses 121-69-7, N,N-Dimethylaniline, uses 462-06-6, Fluorobenzene
RL: MOA (Modifier or additive use); USES (Uses)
(re-oxidation of Si(0 0 1) surfaces modified by self-assembled monolayers)

REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 8 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2003:445928 HCAPLUS Full-text

DOCUMENT NUMBER: 139:203083

TITLE: Investigation of gas-surface interactions at self-assembled silicon surfaces acting as gas sensors
AUTHOR(S): Narducci, Dario; Bernardinello, Patrizia; Oldani, Matteo

CORPORATE SOURCE: Istituto Nazionale per la Fisica della Materia and Department of Materials Science, University of Milano Bicocca, Milan, 20125, Italy

SOURCE: Applied Surface Science (2003), 212-213, 491-496
CODEN: ASUSEE; ISSN: 0169-4332

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

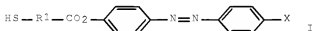
LANGUAGE: English

AB This paper reports the results of an investigation aimed at using self-assembled monolayers to modify the supramol. interactions between Si surfaces and gaseous mols. The specific goal is that of employing molecularly imprinted Si surfaces to develop a new class of chemical sensors capable to detect species with enhanced selectivity. Single-crystal p-type (0 0 1) Si was modified by grafting organic mols. onto its surface by wet chemical synthetic methods. Si was activated toward nucleophilic attack by brominating its surface using a modified version of the purple etch, and aromatic fragments were bonded through the formation of direct Si-C bonds onto it using Grignard reagents or Li aryl species. Formation of self-assembled monolayers (SAMs) was verified by using vibrational spectroscopy. Porous metal-SAM-Si diodes were successfully tested as resistive chemical sensors toward NOx, SOx, CO, NH3 and methane. Current-voltage characteristics measured at different gas compns. showed that the mechanism of surface electron d. modulation involves a modification of the junction barrier height upon gas adsorption. Quantum-mech. simulations of the interaction mechanism were carried out using different computational methods to support such an interaction mechanism. The results obtained appear to open up new relevant applications of the SAM techniques in the area of gas sensing.

CC 66-3 (Surface Chemistry and Colloids)

Section cross-reference(s): 79
 ST silicon surface self assembled monolayer
 ammonia gas sensor
 IT Bromination
 Electric current-potential relationship
 Gas sensors
 Grignard reaction
 Self-assembled monolayers
 (gas-surface interactions at self-assembled Si surfaces acting as NH3
 gas sensors)
 IT 591-51-5, Phenyl lithium 7353-91-5 13139-86-1 586346-16-9
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (gas-surface interactions at self-assembled Si surfaces acting as NH3
 gas sensors)
 OS.CITING REF COUNT: 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD
 (4 CITINGS)
 REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT
 L47 ANSWER 9 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2002:650130 HCAPLUS Full-text
 DOCUMENT NUMBER: 137:201150
 TITLE: Preparation of mercaptoalkanoic acid p-phenylazophenyl
 esters and self-assembled monomolecular film and its
 production method
 INVENTOR(S): Iwayama, Masami; Fujinami, Tatsuo; Tanaka, Masato
 PATENT ASSIGNEE(S): Star Mfg. Co., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
JP 2002241734	A	20020828	JP 2001-43802	20010220
PRIORITY APPLN. INFO.:			JP 2001-43802	20010220
OTHER SOURCE(S):	MARPAT 137:201150			
GI				



AB A self-assembled monolayer (SAM) of an azobenzene derivative is provided, which prevents the decrease of the free space due to the aggregation of the self-assembling compound and thereby maintains the free space so that the azobenzene unit is able to isomerize and efficiently and uniformly changes the surface property. A self-assembled monolayer is formed by adsorbing azobenzene derivs. [I; R¹ = C₃-21 alkylene; X = OH, linear or branched C₁-22 alkyl, C₁-22 acyloxy, C₁-22 fluoroalkyl, C₁-21 alkoxy, aliphatic carboxylic acid residue, (un)substituted aryl] on a substrate. Thus, diazotization of 4-pentylaniline with NaNO₂ in aqueous HCl followed by coupling with phenol gave 4-(4-pentylphenylazo)phenol which was esterified by 11-mercaptopundecanoic acid using DCC in the presence of 4-dimethylaminopyridine in CH₂Cl₂ at room

temperature for 24 h to give 11-mercaptoundecanoic acid 4-(4-pentylphenylazo)phenyl ester. A glass substrate sequentially vapor-deposited with chrome film (5 nm) and gold film (200 nm) was immersed in a 1 mM solution of the thiol I in ethanol for 48 h, taken out from the solution, and the surface was washed with ethanol to thoroughly remove the excess thiol to give a SAM- modified surface. The SAM-modified surface was irradiated by visible light (300-400 nm) and UV light (300-400 nm) using a 200-W mercury-xenon lamp. The change in the contact angle before and after light-irradiation confirmed cis-trans photoisomerization of I, i.e. isomerization from trans to cis isomer by UV light and that from cis to trans by visible light.

IC ICM C09K003-00
ICS C09K003-00; C07C323-52; C09K003-18
CC 25-18 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
Section cross-reference(s): 22, 66
ST mercaptoalkanoic acid phenylazophenyl ester prepn self assembled monomol film; azobenzene self assembled monolayer
cis trans photoisomerization
IT 452304-37-9P, 11-Mercaptoundecanoic acid 4-(4-pentylphenylazo) phenyl ester 452304-38-0P 452304-39-1P
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(preparation of mercaptoalkanoic acid p-phenylazophenyl esters, self-assembly monomol. film on substrate, its production method, and cis-trans photoisomerization)

L47 ANSWER 10 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:749739 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 136:45544

TITLE: Aryl Ketone Photochemistry on Monolayer
Protected Clusters: Study of the Norrish Type II
Reaction as a Probe of Conformational Mobility and for
Selective Surface Modification

AUTHOR(S): Kell, Arnold J.; Workentin, Mark S.
CORPORATE SOURCE: Department of Chemistry, The University of Western
Ontario, London, ON, N6A 5B7, Can.

SOURCE: Langmuir (2001), 17(23), 7355-7363
CODEN: LANGD5; ISSN: 0743-7463

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A series of aryl ketones, namely, 11-mercapto-1-phenyl -undecanone (1), 1-(4-hexyl-phenyl)-11-mercaptoundecanone (2), 1-(4-dodecyl-phenyl)-11-mercaptoundecanone (3), 1-[4-(11-mercaptoundecyl)phenyl]hexanone (4), and 1-[4-(11-mercaptoundecyl)phenyl]undecanone (5), anchored as mixed monolayers with one of hexanethiolate, dodecanethiolate, and octadecanethiolate on gold nanoclusters (so-called monolayer-protected clusters, MPCs) were prepared and characterized. The Norrish-Yang type II photoreactivity of these MPCs was investigated in benzene solution to serve as probes of conformational mobility within the monolayer environment. The aryl ketones react efficiently by a Norrish type II reaction (>75% completion) through their triplet excited state to yield a 1,4-biradical that fragments to give the corresponding alkene and substituted acetophenone-modified MPCs for 1-3 and 4 and 5, resp. The extent of reaction and the efficiency do not appear to depend on the length of the alkanethiolate co-adsorbed onto the MPC or on whether the aryl ketone is further embedded into the monolayer. Notably, there was no evidence for the generation of cyclobutanol products that would be generated from cyclization of the 1,4-biradical or other competing photochem. reactions. The findings of this investigation suggest that the MPC environment is quite dynamic; yet, the exclusive fragmentation products indicate that there are some factors

- affecting the conformational mobility of the triplet biradical. The authors further suggest that the reactivity in MPCs may be greatest at the edge/vertexes with larger constraints on the terraces. Regardless, the Norrish type II reactivity yields efficient fragmentation of either acetophenone or alkene moiety, suggesting such MPCs could find use for the controlled release of substrates in solution
- CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
- ST aryl ketone photolysis monolayer protected gold cluster; Norrish Yang photoreactivity aryl ketone monolayer gold nanocluster; photoreaction mercaptophenyl aryl ketone triplet state monolayer gold nanocluster
- IT Adsorbed monolayers
Conformation
Norrish type II reaction
Photolysis
Self-assembled monolayers
Triplet state transition
(Norrish-Yang type II photoreactivity via excited triplet state of aryl ketones anchored as mixed monolayers with arylthiolate on gold nanoclusters)
- IT Biradicals
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(Norrish-Yang type II photoreactivity via excited triplet state of aryl ketones anchored as mixed monolayers with arylthiolate on gold nanoclusters)
- IT Clusters
RL: NUU (Other use, unclassified); USES (Uses)
(metal, monolayer-protected; Norrish-Yang type II photoreactivity via excited triplet state of aryl ketones anchored as mixed monolayers with arylthiolate on gold nanoclusters)
- IT 304435-86-7DP, 11-Mercapto-1-phenyl-undecanone, gold cluster-bound 380436-07-7DP, 1-(4-Hexyl-phenyl)-11-mercaptoundecanone, gold cluster-bound 380436-08-8DP, 1-(4-Dodecyl-phenyl)-11-mercaptoundecanone, gold cluster-bound 380436-09-9DP, 1-[4-(11-Mercaptoundecyl)phenyl]hexanone, gold cluster-bound 380436-10-2DP, 1-[4-(11-Mercaptoundecyl)phenyl]undecanone, gold cluster-bound
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PRP (Properties); PYP (Physical process); PREP (Preparation); PROC (Process)
(Norrish-Yang type II photoreactivity via excited triplet state of aryl ketones anchored as mixed monolayers with arylthiolate on gold nanoclusters)
- IT 1322-36-7D, Dodecanethiol, gold cluster-bound 2885-00-9D, Octadecanethiol, gold cluster-bound 7440-57-5D, Gold, clusters 142041-95-0D, Hexanethiolate, gold cluster-bound
RL: NUU (Other use, unclassified); USES (Uses)
(Norrish-Yang type II photoreactivity via excited triplet state of aryl ketones anchored as mixed monolayers with arylthiolate on gold nanoclusters)
- IT 98-86-2, properties 106-98-9, 1-Butene, properties 124-11-8, 1-Nonene 6313-88-8 37592-72-6 304435-87-8D, 8-Nonene-1-thiol, gold cluster-bound 380436-11-3D, gold cluster-bound
RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); FORM (Formation, nonpreparative); PROC (Process)
(photoproduct; Norrish-Yang type II photoreactivity via excited triplet state of aryl ketones anchored as mixed monolayers with

arylthiolate on gold nanoclusters)
 OS.CITING REF COUNT: 16 THERE ARE 16 CAPLUS RECORDS THAT CITE THIS
 RECORD (16 CITINGS)
 REFERENCE COUNT: 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 11 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 1999:629621 HCAPLUS Full-text
 DOCUMENT NUMBER: 131:356573
 TITLE: Ion-Ion Collisions Leading to Formation of C-C Bonds
 at Surfaces: An Interfacial Kolbe Reaction
 AUTHOR(S): Shen, Jianwei; Evans, Chris; Wade, Nathan; Cooks, R.
 Graham
 CORPORATE SOURCE: Department of Chemistry, Purdue University, West
 Lafayette, IN, 47906, USA
 SOURCE: Journal of the American Chemical Society (1999),
 121(41), 9762-9763
 CODEN: JACSAT; ISSN: 0002-7863
 PUBLISHER: American Chemical Society
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB An 11-mercaptoundecanoic acid SAM surface treated with ammonium hydroxide to
 convert the acid to the ammonium salt, was bombarded with gas-phase phenylum
 and halophenylum cations at 12 eV, while a scattered ion mass spectra
 recorded on collision of 65 eV Xe⁺ ion beam was used to monitor surface
 composition before and chemical modification. A new surface modification
 method, in the form of direct, reactive incorporation of mol. groups into
 surfaces, has been demonstrated in this study.

CC 66-4 (Surface Chemistry and Colloids)

IT Bond formation
 (carbon-carbon, interfacial Kolbe's electrochem. reaction; interfacial
 Kolbe's reaction of aryl cations with ammonium
 11-mercaptoundecanoate SAM on gold)

IT Ionic collisions
 Self-assembled monolayers
 (interfacial Kolbe's reaction of aryl cations with ammonium
 11-mercaptoundecanoate SAM on gold)

IT Kolbe's electrochemical reaction
 (interfacial; interfacial Kolbe's reaction of aryl cations
 with ammonium 11-mercaptoundecanoate SAM on gold)

IT 250339-43-6D, SAM on gold
 RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC
 (Process); RACT (Reactant or reagent)
 (interfacial Kolbe's reaction of aryl cations with ammonium
 11-mercaptoundecanoate SAM on gold)

IT 17333-73-2, Phenylum 64461-40-1 250349-04-3 250349-06-5
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (interfacial Kolbe's reaction of aryl cations with ammonium
 11-mercaptoundecanoate SAM on gold)

OS.CITING REF COUNT: 17 THERE ARE 17 CAPLUS RECORDS THAT CITE THIS
 RECORD (17 CITINGS)
 REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 12 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 1998:28083 HCAPLUS Full-text
 DOCUMENT NUMBER: 128:185950
 ORIGINAL REFERENCE NO.: 128:36631a, 36634a
 TITLE: Surface-Enhanced Raman Imaging (SERI) of Patterned
 Self-Assembled Monolayers

of Various Derivatized Thiophenols on Silver
 AUTHOR(S): Tryk, Donald A.; Yang, Xiaomin; Hashimoto, Kazuhito; Fujishima, Akira
 CORPORATE SOURCE: The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo, 113, Japan
 SOURCE: Bulletin of the Chemical Society of Japan (1998), 71(1), 31-39
 CODEN: BCSJA8; ISSN: 0009-2673
 PUBLISHER: Chemical Society of Japan
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB Surface-enhanced Raman imaging (SERI) has recently been developed in the authors' laboratory as an imaging technique which is chemical selective, has monolayer sensitivity, and can be used under ambient conditions. A particularly interesting application of this technique is to image patterned self-assembled monolayers (SAMs). The authors used both photopatterning and microcontact printing techniques for preparing patterned SAMs with several different terminal functional groups (NO₂, OH, COOH, and CH₃) on evaporated Ag films and have imaged them using SERI. The intrinsic subsurface roughness of the film provides sufficient enhancement for the imaging.

CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
 Section cross-reference(s): 66, 74

IT Thiols (organic), properties
 Thiols (organic), properties
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
 (aryl; surface-enhanced Raman imaging (SERI) of patterned self-assembled monolayers of various derivatized thiophenols on silver)

IT Imaging
 (surface enhanced Raman; surface-enhanced Raman imaging (SERI) of patterned self-assembled monolayers of various derivatized thiophenols on silver)

IT Carboxyl group
 Functional groups
 Hydroxyl group
 Instrumentation
 Methyl group
 Nitro group
 Photolysis
 Surface roughness
 (surface-enhanced Raman imaging (SERI) of patterned self-assembled monolayers of various derivatized thiophenols on silver)

IT Phenols, properties
 Phenols, properties
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
 (thiophenols; surface-enhanced Raman imaging (SERI) of patterned self-assembled monolayers of various derivatized thiophenols on silver)

IT 7440-50-8, Copper, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (grid; surface-enhanced Raman imaging (SERI) of patterned self-assembled monolayers of various derivatized thiophenols on silver)

IT 7440-47-3, Chromium, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (lithog. mask; surface-enhanced Raman imaging (SERI) of

patterned self-assembled monolayers of various derivatized thiophenols on silver)

IT 50926-11-9, Indium tin oxide
 RL: NUU (Other use, unclassified); USES (Uses) (surface-enhanced Raman imaging (SERI) of patterned self-assembled monolayers of various derivatized thiophenols on silver)

IT 637-89-8, p-Hydroxythiophenol 1073-72-9, p-Methylthiophenol 1074-36-8, 4-Carboxy thiophenol 1849-36-1, p-Nitrothiophenol 7440-22-4, Silver, properties
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process) (surface-enhanced Raman imaging (SERI) of patterned self-assembled monolayers of various derivatized thiophenols on silver)

OS.CITING REF COUNT: 7 THERE ARE 7 CAPLUS RECORDS THAT CITE THIS RECORD (7 CITINGS)

REFERENCE COUNT: 72 THERE ARE 72 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 13 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1999:370936 HCAPLUS Full-text

DOCUMENT NUMBER: 131:136667

TITLE: Photopatterning to create new structures on surfaces

AUTHOR(S): Fox, M. A.; Wolf, M. O.; Stewart, G. M.

CORPORATE SOURCE: Department of Chemistry and Biochemistry, University of Texas at Austin, Austin, TX, 78712, USA

SOURCE: NATO ASI Series, Series C: Mathematical and Physical Sciences (1997), 499 (Modular Chemistry), 53-67
 CODEN: NSCSDW; ISSN: 0258-2023

PUBLISHER: Kluwer Academic Publishers

DOCUMENT TYPE: Journal

LANGUAGE: English

AB UV irradiation of self-assembled monolayers of cis- and trans-4-cyano-4'-(10-thiodecoxy)stilbene on a polycryst. gold surface results in visual surface patterning as a consequence of pronounced changes in the surface hydrophobicity induced by photochem. geometric isomerization. The metal surface influences the efficiency of the photoconversion but does not completely quench excited state reactivity. A novel series of dendrimer segments bearing functionalized aryl chromophores (such as pyrene and naphthalene) at the periphery has been synthesized using a convergent-growth methodol. Selective excitation of the naphthyl-substituted dendrons shows no intramol. excimer formation, although substantial excimer emission is observed with the pyrenyl substituted dendrons. Fluorescence quantum yields are used to define energy migration through the dendritic backbone.

CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT Fluorescence

(of dendrimer segments bearing functionalized aryl chromophores in study of intramol. excimer formation)

REFERENCE COUNT: 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 14 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1995:654664 HCAPLUS Full-text

DOCUMENT NUMBER: 123:241688

ORIGINAL REFERENCE NO.: 123:42939a,42942a

TITLE: High Lateral Resolution Imaging by Secondary Ion Mass Spectrometry of Photopatterned Self-Assembled Monolayers Containing

AUTHOR(S): Aryl Azide
Frisbie, C. Daniel; Wollman, Eric W.; Wrighton, Mark S.

CORPORATE SOURCE: Department of Chemistry, Massachusetts Institute of Technology, Cambridge, MA, 02139, USA

SOURCE: Langmuir (1995), 11(7), 2563-71
CODEN: LANGD5; ISSN: 0743-7463

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Imaging secondary ion mass spectrometry (SIMS) is used to map the distribution of mol. and elemental species in a patterned self-assembled monolayer (SAM) with 1 μm lateral resolution. The patterned SAMs are made by exposing polycryst. Au to a solution of bis(11-(4-azido(benzoyloxy))-1-undecyl) disulfide, I, which forms a photosensitive SAM (Au-I) on the Au. Subsequent UV irradiation ($\lambda > 260 \text{ nm}$) of Au-I SAMs through a mask and a thin film of a secondary amine results in attachment of the amine to the Au-I SAM only in the irradiated regions. The Au-I SAM is photosensitive by virtue of a pendant aryl azide group which reacts with secondary amines under UV irradiation to form hydrazine or azepine photoadducts. A large mol. fragment ion corresponding to vinylferrocene (m/z 212) was mapped with 1 μm lateral resolution on a Au-I SAM that had been irradiated through a mask and a thin film of (2-ferrocenylethyl)(2',2',2'-trifluoroethyl)amine. SIMS can also detect intact mol. ions M^+ corresponding to the 3H-azepine and hydrazine photoadducts obtained upon irradiation of Au-I SAMs in the presence of diethyl- and dibutylamines. Smaller fragment ions characteristic of the 3H-azepine and hydrazine adducts were also observed. The mass assignments were verified by a series of isotopic labeling expts. in which the observed ions displayed the expected isotopic shifts.

CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST SIM imaging photoreaction selfassembled monolayer azide; aryl azide monolayer photolysis mass spectrometry; lithog photoimaging azide monolayer amine photoreaction; amine photopatterning aryl azide monolayer; surface photochem aryl azide monolayer amine

IT Lithography
(photo-, surface photochem. to pattern self-assembled monolayers of aryl azide with amines on gold surface and SIMS imaging of ion distribution in)

IT Mass spectra
(secondary-ion, imaging; in photopatterning based on surface photochem. of self-assembled monolayers of aryl azide with amines on gold surface)

IT Photolysis
(surface, SIMS imaging in photopatterning based on photoreaction of self-assembled monolayers of aryl azide with amines on gold surface and)

IT 7440-57-5, Gold, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(photopatterning based on photochem. reaction of self-assembled monolayers of aryl azide with amines on gold surface)

IT 109-89-7, reactions 111-92-2, Dibutylamine 148149-86-4, Bis(11-(4-azido(benzoyloxy))-1-undecyl) disulfide 148752-29-8 168985-46-4 168985-47-5
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(photopatterning based on photochem. reaction of self-

assembled monolayers of aryl azide with amines on gold surface)

IT 121195-16-2P 168985-42-0P
 RL: PEP (Physical, engineering or chemical process); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)
 (photopatterning based on photochem. reaction of self-assembled monolayers of aryl azide with amines on gold surface)

OS.CITING REF COUNT: 21 THERE ARE 21 CAPLUS RECORDS THAT CITE THIS RECORD (21 CITINGS)

L47 ANSWER 15 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 1994:469310 HCAPLUS Full-text
 DOCUMENT NUMBER: 121:69310
 ORIGINAL REFERENCE NO.: 121:12261a,12264a
 TITLE: Selective Electrochemical Deposition of Polyaniline via Photopatterning of a Monolayer-Modified Substrate
 AUTHOR(S): Rozsnyai, Lawrence F.; Wrighton, Mark S.
 CORPORATE SOURCE: Department of Chemistry, Massachusetts Institute of Technology, Cambridge, MA, 02139, USA
 SOURCE: Journal of the American Chemical Society (1994), 116(13), 5993-4
 CODEN: JACSAT; ISSN: 0002-7863
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB The authors demonstrate that a pattern of electropolymd. aniline replicates the pattern formed by irradiation of a self-assembled monolayer. Self-assembled monolayers of an alkyl thiolate terminating in a photosensitive aryl azide group formed on a Au substrate can be patterned photochem. by near-UV irradiation through a mask in the presence of an amine such as HNet2, HN(n-Bu)2, or HN(CH2CH2OH)2. Initially, electropolymn. of aniline on such a substrate results in deposition of polyaniline selectively on the unirradiated regions of the surface. While the self-assembled monolayer itself inhibits oxidation of aniline compared to bare Au, the irradiated portions of the surface bearing the amine functional groups inhibit electron transfer to a greater extent than the unirradiated areas. The rate of aniline oxidation can be determined by measuring the c.d. associated with oxidation of 0.11 M aniline in aqueous 0.85 M H2SO4, 0.25 M NaHSO4 as a function of potential. Inhibition of polyaniline oxidation depends on the amine used, with HN(n-Bu)2 > HNet2 > HN(CH2CH2OH)2, and on the potential used in the deposition. Approx. micron-sized polymer features are easily fabricated using this technique.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 Section cross-reference(s): 35, 72

IT Photolysis
 (of self-assembled monolayer of disulfides on gold, selective electrochem. deposition of polyaniline by photopatterning in)

IT Lithography
 (photo-, selective electrochem. deposition of polyaniline via photopatterning of monolayer-modified gold substrate)

IT 111-42-2, Diethanolamine, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (photochem. reaction of, with self-assembled monolayer of disulfides on gold, selective electrochem. deposition of polyaniline in)

IT 111-92-2, Dibutylamine
 RL: USES (Uses)
 (photochem. reaction with self-assembled

monolayer of disulfides on gold, electrochem. deposition of polyaniline in)

IT 109-89-7, Diethylamine, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (photochem. reaction with self-assembled monolayer of disulfides on gold, electrochem. deposition of polyaniline in)

IT 148149-86-4, Bis(11-((4-azidobenzoyl)oxy)-1-undecyl)disulfide
 RL: USES (Uses)
 (self-assembled monolayer of, on gold, selective electrochem. deposition of polyaniline via photopatterning of)

OS.CITING REF COUNT: 68 THERE ARE 68 CAPLUS RECORDS THAT CITE THIS RECORD (68 CITINGS)

L47 ANSWER 16 OF 22 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1994:334598 HCAPLUS Full-text

DOCUMENT NUMBER: 120:334598

ORIGINAL REFERENCE NO.: 120:58624h,58625a

TITLE: Photosensitive Self-Assembled Monolayers on Gold: Photochemistry of Surface-Confined Aryl Azide and Cyclopentadienylmanganese Tricarbonyl
 AUTHOR(S): Wollman, Eric W.; Kang, Doris; Frisbie, C. Daniel; Lorkovic, Ivan M.; Wrighton, Mark S.
 CORPORATE SOURCE: Department of Chemistry, Massachusetts Institute of Technology, Cambridge, MA, 02139, USA
 SOURCE: Journal of the American Chemical Society (1994), 116(10), 4395-404
 CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Photosensitive self-assembled monolayers (SAMs) are prepared by the spontaneous reaction of di-11-(4-azidobenzoate)-1-undecyl disulfide (I), or 11-mercaptoundecylcyclopentadienylmanganese tricarbonyl (II) with polycryst. Au. SAMs of I are photosensitive by virtue of a pendant aryl azide moiety ($\lambda_{\text{max}} = 270 \text{ nm}$, $\log \epsilon = 4.2$) which undergoes photoreaction with secondary amines to form Au-confined derivs. of 3-H azepine and hydrazine, while Au-II SAMs undergo photosubstitution of phosphine for CO. Au-I SAMs irradiated in the presence of various secondary amines were characterized by reflection absorption IR spectroscopy (RAIRS), XPS, and cyclic voltammetry, and showed persistent attachment of approx. one monolayer of amine. IR spectroscopy was used to establish that primary photoproducts obtained upon irradiation of Au-I SAMs in diethylamine are nearly identical to primary photoproducts obtained upon irradiating an analog of I, Me 4-azidobenzoate, in diethylamine solution XPS anal. of Au-I SAMs before and after irradiation in the presence of secondary amines confirms loss of N₂ from the Au-I SAM and incorporation of one nitrogen atom per surface-confined mol. Most definitively, cyclic voltammetry of Au-I after irradiation in the presence of 2-ferrocenylethyl-2',2'-trifluoroethylamine (III) showed $3.3 + 10 \times 10^{-10} \text{ mol-cm}^{-2}$ of surface-confined ferrocene. Pos. ion SIMS spectra of Au-II irradiated in the presence of PPh₂Et, PPh₂(n-Pr), PPh₂(CH₂)₁₁Fc (Fc = ferrocenyl), or PPh₂(CH₂)₂(CF₂)₅CF₃, show that introduction of the phosphine onto the surface occurs upon near-UV irradiation. Importantly, the surface photochem. of I and II allows the high lateral resolution patterning of Au surfaces and Au microstructures with a variety of mol. reagents. SIMS maps for vinyl ferrocenium (m/z 212) or F- (m/z 19) of flat Au-II substrates irradiated through a Cr-on-glass mask in the presence of PPh₂(CH₂)₁₁Fc or PPh₂(CH₂)₂(CF₂)₅CF₃ demonstrate photochem. patterning at a lateral resolution of $< 2 \mu\text{m}$. SEM confirms the resolution of $2 \mu\text{m}$ features in the irradiated

monolayer. Cyclic voltammetry and SIMS were used to demonstrate that Au microstructures derivatized with I can be patterned with mol. reagents, also at a lateral resolution of $<2 \mu\text{m}$ by UV irradiation through a mask and a thin film of the desired amine. A condensation figure was used to demonstrate photopatterning of a flat Au-I substrate irradiated through a mask and a thin film of (C₂H₅OH)₂NH.

- CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
- ST surface photolysis aryl azide cyclopentadienylmanganese tricarbonyl; manganese cyclopentadienyl tricarbonyl gold surface photolysis; photoimaging microlithog selfassembled monolayers gold; photoattachment amine phosphine surface modification photopatterning
- IT Photoimaging compositions and processes
(of self-assembled monolayers of diazidobenzoateundecyl disulfide and mercaptoundecylcyclopentadienylmanganese tricarbonyl on gold in presence of amines and phosphines)
- IT Interface
(photochem. at, of self-assembled monolayers of aryl azide and cyclopentadienylmanganese tricarbonyl on gold in presence of amine and phosphine reagent)
- IT Lithography
(photo-, patterning of self-assembled monolayers of diazidobenzoateundecyl disulfide and mercaptoundecylcyclopentadienylmanganese tricarbonyl on gold surface for)
- IT Resists
(photo-, self-assembled monolayers of diazidobenzoateundecyl disulfide and mercaptoundecylcyclopentadienylmanganese tricarbonyl on gold surface in relation to)
- IT Photolysis
(surface, of self-assembled monolayers of diazidobenzoateundecyl disulfide and mercaptoundecylcyclopentadienylmanganese tricarbonyl on gold, in presence of amines and phosphines)
- IT 155452-33-8P
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in photoimaging reaction of self-assembled monolayers of diazidobenzoateundecyl disulfide on gold surface)
- IT 148752-29-8
RL: USES (Uses)
(photolysis of self-assembled monolayers of diazidobenzoateundecyl disulfide on gold surface containing, photoimaging in relation to)
- IT 109-89-7, Diethylamine, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(photolysis of self-assembled monolayers of diazidobenzoateundecyl disulfide on gold surface containing, photoimaging in relation to)
- IT 607-01-2 7650-84-2 154925-69-6 155452-32-7
RL: USES (Uses)
(photolysis of self-assembled monolayers of mercaptoundecylcyclopentadienylmanganese tricarbonyl on gold surface containing, photoimaging in relation to)
- IT 148149-86-4
RL: USES (Uses)
(photolysis of self-assembled monolayers

of, on gold surface, photoimaging reaction with amines in)
 IT 135972-97-3
 RL: USES (Uses)
 (photolysis of self-assembled monolayers
 of, on gold surface, photoimaging reaction with phosphines in)
 IT 111-42-2, Diethanolamine, uses
 RL: USES (Uses)
 (photopatterning of self-assembled
 monolayers of diazidobenzoateundecyl disulfide on gold surface
 using film of)

OS.CITING REF COUNT: 94 THERE ARE 94 CAPLUS RECORDS THAT CITE THIS
 RECORD (94 CITINGS)

L47 ANSWER 17 OF 22 COMPENDEX COPYRIGHT 2009 EEI on STNDUPLICATE 2
 ACCESSION NUMBER: 2004-027809601 COMPENDEX Full-text
 TITLE: Effect of surface functional groups on nanostructure
 fabrication using AFM lithography
 AUTHOR(S): Park Jinyoung; Lee Haiwon
 CORPORATE SOURCE: Park Jinyoung; Lee Haiwon (Department of Chemistry,
 Hanyang University, 17 Haengdang-dong, Sungdong-gu,
 Seoul 133-791 (KR))
 EMAIL: haiwon@hanyang.ac.kr
 SOURCE: Materials Science and Engineering C (5 Jan 2004) Volume
 24, Number 1-2, pp. 311-314, 8 refs.
 ISSN: 0928-4931
 DOI: 10.1016/j.msec.2003.09.061
 Published by: Elsevier Ltd
 COUNTRY OF PUBLICATION: United Kingdom
 DOCUMENT TYPE: Journal; Article; Theoretical; Experimental
 LANGUAGE: English
 SUMMARY LANGUAGE: English
 ENTRY DATE: Entered STN: 4 Jan 2009
 Last updated on STN: 4 Jan 2009

AB The surface functional group dependency of atomic force microscope (AFM)
 lithography was investigated using three kinds of self-assembled monolayers
 (SAMs) as a resist film on silicon wafer. The amine-modified surface of 3-
 aminopropyltriethoxysilane, phenyl-modified surface of phenyltriethoxysilane
 and methyl-modified surface of octadecyltrichlorosilane SAMs were
 investigated. The characterizations of these SAMs were carried out by
 ellipsometer, contact angle goniometer and AFM. The effect of applied
 voltage of AFM lithography on the line-height and the effect of surface
 chemical functionality of the resist film on the line-width are discussed in
 this paper. .COPYRGT. 2003 Elsevier B.V. All rights reserved.

AN 2004-027809601 COMPENDEX Full-text
 CC 714.2 Semiconductor Devices and Integrated Circuits; 741.3 Optical
 Devices and Systems; 931.2 Physical Properties of Gases, Liquids and
 Solids; 933.1 Crystalline Solids; 941.4 Optical Variables Measurements;
 943.3 Special Purpose Instruments

CT *Materials science; Atomic force microscopy; Ellipsometry; Fabrication;
 Goniometers; Lithography; Nanostructured materials; Self
 assembly; Silicon wafers

ST Resist films

L47 ANSWER 18 OF 22 INSPEC (C) 2009 IET on STN DUPLICATE 3
 ACCESSION NUMBER: 2002:7256629 INSPEC Full-text
 DOCUMENT NUMBER: A2002-12-6817-002
 TITLE: Selective deposition of rod-like phthalocyanine
 aggregates on Au surfaces patterned
 with a combination of microcontact printing and
 electropolymerization

AUTHOR: Zangmeister, R.A.P.; O'Brien, D.F.; Armstrong, N.R.
(Dept. of Chem., Arizona Univ., Tucson, AZ, USA)

SOURCE: Advanced Functional Materials (March 2002), vol.12,
no.3, p. 179-86, 51 refs.
CODEN: AFMDC6, ISSN: 1616-301X
SICI: 1616-301X(200203)12:3L:179:SDLP;1-T
Price: 1616-301X/02/\$17.50+.50/0
Published by: Wiley-VCH, Germany

DOCUMENT TYPE: Journal

TREATMENT CODE: Experimental

COUNTRY: Germany

LANGUAGE: English

AB Patterned thin films of a unique phthalocyanine (Pc), (2,3,9,10,16,17,23,24-oktakis((2-benzoyloxy)ethoxy)phthalocyaninato) copper (1), are created by means of capillary flow of chloroform solutions into micrometer-dimension hydrophobic/hydrophilic channels. These channels are created by a combination of microcontact printing of octadecylmercaptan (C18-SH) layers on gold, creating a hydrophobic channel bottom, and oxidative electropolymerization of m-aminophenol (at pH 4), creating hydrophilic channel walls (microcontact printing/electropolymerization, μ CP-EP). The polyphenoxide channel walls grow perpendicular to the substrate plane, with excellent retention of structure to thicknesses (ca. 30 nm) far exceeding the height of the C18-self-assembled monolayer (SAM). Doping of the C18-SAM layers with small percentages of 1-phenyldodecane provides for efficient wetting of the channel bottoms with solutions of 1, consistent with recent studies, which have shown the need for phenyl-termination of substrates surfaces to create coherent rod-like aggregate structures. These optimized channels provide for excellent capillary flow conditions for chloroform solutions of 1, yielding 10 μ m width Pc films with thicknesses exceeding the height of the polyphenoxide channel walls by up to 10 \times . We also present evidence for formation of birefringent (ordered) material near the hydrophilic walls

AN 2002:7256629 INSPEC DN A2002-12-6817-002 Full-text

CC A6817 Monolayers and Langmuir-Blodgett films; A7865T Optical properties of organic compounds and polymers (thin films/low-dimensional structures); A8235 Polymer reactions and polymerization; A4760 Flows in ducts, channels, and conduits; A7820F Birefringence (condensed matter); A6130 Liquid crystals

CT birefringence; capillarity; channel flow; discotic liquid crystals; Langmuir-Blodgett films; lithography; organic compounds; polymerisation; wetting

ST rod-like phthalocyanine aggregates; selective deposition; Au surfaces; microcontact printing; electropolymerization; patterned thin films; (2,3,9,10,16,17,23,24-oktakis((2-benzoyloxy)ethoxy)phthalocyaninato) copper; capillary flow; chloroform solutions; micrometer-dimension hydrophobic/hydrophilic channels; octadecylmercaptan layers; hydrophobic channel bottom; m-aminophenol; hydrophilic channel walls; polyphenoxide channel walls; C18-self-assembled monolayer
; 1-phenyldodecane; channel bottom wetting; birefringent material; discotic liquid crystals; liquid crystal confinement; soft lithography; LB films; Au

CHI Au sur, Au el

ET Au; C¹⁸H¹⁷S; SH; S cp; cp; H cp; C18-SH

L47 ANSWER 19 OF 22 INSPEC (C) 2009 IET on STN

ACCESSION NUMBER: 2009:10551850 INSPEC Full-text

TITLE: Sum frequency generation imaging microscopy of patterned self-assembled monolayers with terminal -CH₃, -OCH₃, -CF₂CF₃, -C=C, -phenyl, and -cyclopropyl groups

AUTHOR: Cimatu, K. (Dept. of Chem., Univ. of Houston, Houston,

TX, USA), Moore, H.J. (Dept. of Chem., Univ. of Houston, Houston, TX, USA), Barriet, D. (Dept. of Chem., Univ. of Houston, Houston, TX, USA), Chinwangso, P. (Dept. of Chem., Univ. of Houston, Houston, TX, USA), Lee, T.R. (Dept. of Chem., Univ. of Houston, Houston, TX, USA), Baldelli, S. (Dept. of Chem., Univ. of Houston, Houston, TX, USA)

SOURCE: Journal of Physical Chemistry C (18 Sept. 2008), vol.112, no.37, p. 14529-37, 47 refs.ISSN: 1932-7447
Published by: American Chemical Society, USA

DOCUMENT TYPE: Journal

TREATMENT CODE: Experimental

COUNTRY: United States

LANGUAGE: English

AB Vibrational spectroscopic imaging is demonstrated for a variety of organic monolayer-functionalized surfaces patterned using microcontact printing. The images from sum frequency generation imaging microscopy (SFGIM) are analyzed using different contrast mechanisms in the interpretation of the transition from stamped to backfilled regions of interest. For this experiment, microcontact printing is used to spatially control the surface monolayers by using a patterned stamp and by varying the terminal functional group of the backfilling solutions. Analysis by the three different methods suggests that significant mixing occurs between the stamped and backfilled regions, which influence the contrast in the images at the resonant peaks. In addition, the interference between the resonant peaks and nonresonant background also has an effect on the appearance of the image.

AN 2009:10551850 INSPEC Full-text

CC A6817 Monolayers and Langmuir-Blodgett films; A4265K Optical harmonic generation, frequency conversion, parametric oscillation and amplification; A7830J Infrared and Raman spectra in organic crystals; A8116R Nanopatterning; A6845D Adsorption and desorption kinetics; evaporation and condensation; A8265M Sorption and accommodation coefficients (surface chemistry)

CT adsorption; gold; monolayers; nanopatterning; optical frequency conversion; organic compounds; self-assembly; soft lithography; vibrational modes

ST sum frequency generation imaging microscopy; patterned self-assembled monolayers; cyclopropyl groups; phenyl groups; vibrational spectroscopic imaging; organic monolayer-functionalized surfaces; microcontact printing; terminal functional group; interference; CH3 group; OCH3 group; CF2CF3 group; C=O group; adsorption; Au

CHI Au sur, Au el

ET C*F; CF3; C cp; cp; F cp; C; Au; C*H; CH3; H cp; C*H*O; OCH3; O cp; CF2CF3

L47 ANSWER 20 OF 22 SCISEARCH COPYRIGHT (c) 2009 The Thomson Corporation on STN

ACCESSION NUMBER: 2003:1006773 SCISEARCH Full-text

THE GENUINE ARTICLE: 741XC

TITLE: Formation, characterization, and sub-50-nm patterning of organosilane monolayers with embedded disulfide bonds: An engineered self-assembled monolayer resist for electron-beam lithography

AUTHOR: Lieberman M (Reprint)

CORPORATE SOURCE: Univ Notre Dame, Dept Chem & Biochem, Notre Dame, IN 46556 USA (Reprint)

AUTHOR: Wang X J; Hu W C; Ramasubramaniam R; Bernstein G H; Snider G

CORPORATE SOURCE: Univ Notre Dame, Dept Elect Engrn, Notre Dame, IN 46556 USA
 COUNTRY OF AUTHOR: USA
 SOURCE: LANGMUIR, (11 Nov 2003) Vol. 19, No. 23, pp. 9748-9758.
 ISSN: 0743-7463.
 PUBLISHER: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036
 USA.
 DOCUMENT TYPE: Article; Journal
 LANGUAGE: English
 REFERENCE COUNT: 49
 ENTRY DATE: Entered STN: 8 Dec 2003
 Last Updated on STN: 8 Dec 2003

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB This paper describes self-assembled monolayers (SAMs) that contain embedded disulfide bonds and the selective cleavage of the disulfides by electron-beam lithography (EBL). Phenyl (3-trimethoxysilylpropyl)-disulfide (1) forms siloxane SAMs with a root-mean-square roughness of 1.8 Angstrom. The disulfide bonds in I remain intact in the SAM and can react with dithiothreitol after monolayer formation, forming surface thiols, which can be derivatized with maleimide dyes. Atomic force microscopy (AFM) anodization and EBL have been used to create high-resolution patterns on the disulfide-containing monolayer. AFM anodization on monolayer I achieves 20-nm resolution lines with both topographic and chemical alterations in the patterned region. EBL with an accelerating voltage of 30 kV generates trenches 3-4 Angstrom deep and 30 nm wide. According to AFM topographic and friction images, X-ray photoelectron spectroscopy damage simulation, and chemical rebinding tests, the chemical changes induced by EBL are consistent with cleavage of the disulfide bonds to form sulphydryl groups. The resulting chemical patterns can be further developed by reaction with N-(1-pyrene)maleimide.

CC CHEMISTRY, PHYSICAL

STP KeyWords Plus (R): RAY PHOTOELECTRON-SPECTROSCOPY; CONSTRUCTIVE NANOLITHOGRAPHY; SURFACE MODIFICATION; SILICON; NANOFABRICATION; TEMPLATES; DAMAGE; PHOTOCHEMISTRY; MICROSCOPE; NANOWIRES
 ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L47 ANSWER 21 OF 22 SCISEARCH COPYRIGHT (c) 2009 The Thomson Corporation on STN

ACCESSION NUMBER: 2003:414800 SCISEARCH Full-text
 THE GENUINE ARTICLE: 676ZB
 TITLE: Sub-100-nm pattern formation through selective chemical transformation of self-assembled monolayers by soft X-ray irradiation
 AUTHOR: Park J W (Reprint)
 CORPORATE SOURCE: Pohang Univ Sci & Technol, Div Mol & Life Sci, Dept Chem, Ctr Integrated Mol Syst, San 31 Hyoja Dong, Pohang 790784, South Korea (Reprint)
 AUTHOR: La Y H; Jung Y J; Kim H J; Kang T H; Ihm K; Kim K J; Kim B
 CORPORATE SOURCE: Pohang Univ Sci & Technol, Div Mol & Life Sci, Dept Chem, Ctr Integrated Mol Syst, Pohang 790784, South Korea; Pohang Accelerator Lab, Pohang 790784, South Korea
 COUNTRY OF AUTHOR: South Korea
 SOURCE: LANGMUIR, (13 MAY 2003) Vol. 19, No. 10, pp. 4390-4395.
 ISSN: 0743-7463.
 PUBLISHER: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036
 USA.
 DOCUMENT TYPE: Article; Journal
 LANGUAGE: English
 REFERENCE COUNT: 87
 ENTRY DATE: Entered STN: 30 May 2003
 Last Updated on STN: 30 May 2003

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB A new nanopatterning system based on a soft X-ray induced chemical transformation of a nitro-substituted aromatic imine monolayer has been developed. The molecular layer was exposed to soft X-rays, and the involved chemical transformation on the molecular layer was analyzed by using Fourier transform infrared reflection-absorption spectroscopy. As a result, we could confirm that the nitro group on the imine monolayer was cleaved upon the soft X-ray irradiation, leaving the hydrophobic phenyl unit intact on the monolayer surface, while the imine functionality was transformed into a new nonhydrolyzable one. However, the source of the hydrogen atom for the reduction and the final functionality at the para position of the aromatic group are unknown yet. Whereas, we could restore the hydrophilic amine functionality from the unexposed imine monolayer through hydrolysis. These phenomena were applied to the patterning of self-assembled monolayers featuring alternating height, chemical reactivity, and wettability. Alternating surface wettability is evident when water is sprayed on a macroscopically patterned substrate and the plate is tilted to drip the water. Also, atomic force microscope images revealed patterns as small as less than or equal to 100 nm with regular height and phase variations. The patterned monolayer was further modified with a linker and Cy3-tagged oligonucleotide, sequentially. Fluorescence images showed that the above molecules were selectively immobilized onto the amine-terminated region of the patterned surface.

CC CHEMISTRY, PHYSICAL

STP KeyWords Plus (R): ELECTRON-BEAM LITHOGRAPHY; OPTICAL LITHOGRAPHY; PHOTOELECTRON-SPECTROSCOPY; SURFACE-DENSITY; THIN-LAYERS; AMINE GROUP; SENSORS; FUTURE; DAMAGE; RESOLUTION
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L47 ANSWER 22 OF 22 SCISEARCH COPYRIGHT (c) 2009 The Thomson Corporation on STN

ACCESSION NUMBER: 1999:332481 SCISEARCH Full-text

THE GENUINE ARTICLE: 189YV

TITLE: Surface functionalization and imaging using monolayers and surface-grafted polymer layers

AUTHOR: Bianconi P A (Reprint)

CORPORATE SOURCE: Univ Massachusetts, Dept Chem, Amherst, MA 01003 USA (Reprint)

AUTHOR: Ingall M D K; Honeyman C H; Mercure J V; Kunz R R

CORPORATE SOURCE: Penn State Univ, Dept Chem, University Pk, PA 16802 USA; MIT, Lincoln Lab, Lexington, MA 02173 USA

COUNTRY OF AUTHOR: USA

SOURCE: JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, (21 APR 1999)

Vol. 121, No. 15, pp. 3607-3613.

ISSN: 0002-7863.

PUBLISHER: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036 USA.

DOCUMENT TYPE: Article; Journal

LANGUAGE: English

REFERENCE COUNT: 67

ENTRY DATE: Entered STN: 1999

Last Updated on STN: 1999

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB A method of surface functionalization of ceramics with monolayers and surface grafted polymer layers is described. A phenylsilane monolayer is created on the substrate's oxide surface by using phenyltrichlorosilane as the silane coupling agent. To control the formation of the monolayer and ensure the growth of a dense, homogeneous layer, the ceramic surface is first dried and then a controlled amount of water is adsorbed onto it, and a hindered organic base is added to the phenyltrichlorosilane solution to

absorb acid generated in the reaction of the silane coupling agent with hydroxyl groups on the ceramic surface. This procedure results in dense homogeneous phenylsilane monolayers on a variety of surfaces, including silicon, Pt/PtO, and quartz. These layers can now be functionalized by addition of triflic acid, which removes the phenyl ring as benzene, and introduction of a nucleophile. Monolayers of $-C=CH$, $-OCH_2CF_3$, $[(OCH_2CH_2)(2)O]$, $-OCH_2CF_2CF_3$, and $-O(CH_2)(6)NH_2$ were generated in this fashion, all proving to be continuous and homogeneous. In addition, the cationic silyl triflate site generated by the removal of the phenyl ring is capable of initiating polymerization to form covalently bound polymer layers on the surface. Polymer layers of poly(methyl methacrylate), poly(propylene oxide), and poly(dimethylsiloxane) were generated in this manner; in the case of poly(dimethylsiloxane), layers up to 300 Angstrom thick were formed. Anionic initiation of polymerization is also possible, using a bromopropyl trichlorosilane coupling agent to form the initial monolayer, followed by lithiation with lithium di-tert-butylbiphenyl. Acrylonitrile can be anionically polymerized to films of up to 2450 Angstrom in thickness. The monolayers and polymer layers were characterized by XPS, AFM, contact angle measurements, and profilometry and were found to be continuous. The initial phenylsilane monolayer can be lithographically patterned by using 193 nm Light to cleave the surface phenyl groups; the remaining groups can then be functionalized as discussed above to create surface-grafted patterned polymer layers.

CC CHEMISTRY, MULTIDISCIPLINARY

STP KeyWords Plus (R): SELF-ASSEMBLED MONOLAYERS

; COPLANAR MOLECULAR ASSEMBLIES; CHEMICAL-VAPOR-DEPOSITION; CATIONIC POLYMERIZATION; THIN-FILMS; NEGATIVE RESIST; EDGE ROUGHNESS; ACID-DIFFUSION; GOLD; SOLVENT

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

=> d his nofi

(FILE 'HOME' ENTERED AT 14:31:42 ON 28 OCT 2009)

FILE 'HCAPLUS' ENTERED AT 14:31:59 ON 28 OCT 2009

L1 1 SEA ABB=ON PLU=ON US20070140901/PN
D TALL

FILE 'REGISTRY' ENTERED AT 14:33:24 ON 28 OCT 2009

L2 1 SEA ABB=ON PLU=ON 2396-01-2/RN
L3 1 SEA ABB=ON PLU=ON 92-52-4/RN
L4 1 SEA ABB=ON PLU=ON 26140-60-3/RN
L5 1 SEA ABB=ON PLU=ON 37361-95-8/RN
L6 1 SEA ABB=ON PLU=ON 37275-48-2/RN

FILE 'HCAPLUS' ENTERED AT 14:42:33 ON 28 OCT 2009

L7 942 SEA ABB=ON PLU=ON SURFACE(W)MODIF? (3A) LAYER?
L8 18364 SEA ABB=ON PLU=ON ((SELF(W)ASSEMBL?) (W) (MONOLAYER# OR
MONO(W) LAYER#))
L9 14707 SEA ABB=ON PLU=ON "SAM"
L10 1828847 SEA ABB=ON PLU=ON PHENYL OR BIPHENYL OR TERPHENYL
L11 70335 SEA ABB=ON PLU=ON ANTHRACYL OR NAPHTHYL OR BIPYRIDYL OR
TERPYRIDYL
L12 6620 SEA ABB=ON PLU=ON THIOPHENYL OR BITHIENYL OR TERTHIENYL OR
PYRROLYL
L13 12 SEA ABB=ON PLU=ON (BI OR TRI) (W) CYCLOALKANE# OR TETRA(W)CYCL
OALKANE#
L14 2116 SEA ABB=ON PLU=ON (L8 OR L9) AND ((L10 OR L11 OR L12 OR
L13))
L15 1 SEA ABB=ON PLU=ON L14 AND L7
D SCA TI HIT
L16 48885 SEA ABB=ON PLU=ON (L2 OR L3 OR L4 OR L5 OR L6)
L17 24 SEA ABB=ON PLU=ON (L8 OR L9) AND L16
L18 7 SEA ABB=ON PLU=ON L17 AND 66/SC, SX
D SCA TI HIT

FILE 'STNGUIDE' ENTERED AT 14:52:18 ON 28 OCT 2009

FILE 'HCAPLUS' ENTERED AT 14:53:27 ON 28 OCT 2009

L19 245508 SEA ABB=ON PLU=ON ARYL
L20 21238 SEA ABB=ON PLU=ON ALICYCLIC
L21 165 SEA ABB=ON PLU=ON (L8 OR L9) AND (L19 OR L20)
L22 1 SEA ABB=ON PLU=ON L21 AND L1
L23 69 SEA ABB=ON PLU=ON L21 AND 66/SC, SX
L24 1 SEA ABB=ON PLU=ON L23 AND L7
L25 4 SEA ABB=ON PLU=ON L23 AND (SURFACE(W)MODIF?)
D SCA TI HIT
L26 8 SEA ABB=ON PLU=ON L21 AND LITHOGRAPH?
L27 10 SEA ABB=ON PLU=ON (L24 OR L25 OR L26)
L28 46 SEA ABB=ON PLU=ON L21 AND ((L10 OR L11 OR L12 OR L13))
L29 1 SEA ABB=ON PLU=ON L28 AND LITHOGRAPH?
L30 9 SEA ABB=ON PLU=ON L28 AND (SURFAC?) (2A) (TRANSIT? OR MODIF?
OR PATTERN?)
D SCA TI HIT
L31 17 SEA ABB=ON PLU=ON L27 OR L30
L32 17 SEA ABB=ON PLU=ON L31 AND (L8 OR L9)
L33 16 SEA ABB=ON PLU=ON L32 AND (AY<2006 OR PY<2006 OR PRY<2006)
SAVE TEMP L32 LEE654HCAP/A

FILE 'STNGUIDE' ENTERED AT 15:09:10 ON 28 OCT 2009

FILE 'WPIX' ENTERED AT 15:11:30 ON 28 OCT 2009

L34 258 SEA ABB=ON PLU=ON (L8 OR L9) AND ((L10 OR L11 OR L12 OR L13))

L35 14 SEA ABB=ON PLU=ON L34 AND LITHOGRAPH?
D TI KWIC
D TI KWIC 2-5

L36 37 SEA ABB=ON PLU=ON L34 AND (SURFAC?) (2A) (TRANSIT? OR MODIF?
OR PATTERN?)

L37 8 SEA ABB=ON PLU=ON L36 AND LITHOGRAPH?

L38 14 SEA ABB=ON PLU=ON L35 OR L37

L39 6 SEA ABB=ON PLU=ON L38 AND (ARYL OR HETERO(W)ARYL OR ALICYCLIC
OR HETERO(W)CYCLIC)
D TI KWIC 1-6

L40 14 SEA ABB=ON PLU=ON L38 OR L39
SAVE TEMP L40 LEE654WPIX/A

FILE 'EMA, COMPEINDEX, INSPEC, SCISEARCH, PASCAL, JAPIO' ENTERED AT 15:18:20 ON 28 OCT 2009

L41 102 SEA ABB=ON PLU=ON L35

L42 11 SEA ABB=ON PLU=ON L41 AND (SURFAC?) (2N) (TRANSIT? OR MODIF?
OR PATTERN?)

L43 1 SEA ABB=ON PLU=ON L41 AND (ARYL OR HETERO(W) ARYL OR
ALICYCLIC OR HETERO(W) CYCLIC)

L44 11 SEA ABB=ON PLU=ON L42 OR L43
D SCA L43
SAVE TEMP L44 LEE654MULTI/A

FILE 'WPIX' ENTERED AT 15:21:47 ON 28 OCT 2009

SEL L40 AP PN

L45 18 SEA ABB=ON PLU=ON (WO2002-EP14769/AP OR WO2005-GB1159/AP OR
US2001-350090P/AP OR US2002-284794/AP OR WO2000-US25518/AP OR
AU2002-321990/AP OR AU2002-358799/AP OR AU2002-365147/AP OR
AU2002-367538/AP OR AU2002321990/PN OR AU2002358799/PN OR
AU2002365147/PN OR AU2002367538/PN OR AU2003-233579/AP OR
AU2003233579/PN OR CN2005-10087971/AP OR GB2006-18673/AP OR
GB2426724/PN OR US2002-381913P/AP OR US2003-441965/AP OR
WO2002-US34970/AP OR WO2002-US35134/AP OR WO2003-US15757/AP OR
WO2005-US8850/AP OR WO2005089415/PN OR WO2007-US19894/AP OR
WO2008108809/PN OR AU2001-32614/AP OR AU2001032614/PN OR
"CN100539201 C"/PN OR CN1734792/PN OR CN1958301/PN OR CN2006-10
143605/AP OR DE10164309/PN OR DE2001-10164309/AP OR EP1441695/P
N OR EP1461619/PN OR EP1509336/PN OR EP1542869/PN OR EP1630883/
PN OR EP1782886/PN OR EP2000-991376/AP OR EP2002-793118/AP OR
EP2002-803299/AP OR EP2003-729016/AP OR EP2005-23880/AP OR
EP2005-254258/AP OR JP2001-530895/AP OR JP2003-556808/AP OR
JP2004518268/PN OR JP2005-216748/AP OR JP2005524829/PN OR
JP2006049890/PN OR JP2007-274254/AP OR JP2008183702/PN OR
KR2007-8357/AP OR KR825176/PN OR TW2000-119232/AP OR TW463183/P
N OR US1999-154716P/AP OR US1999-157149P/AP OR US2000-527885/AP
OR US2000-551716/AP OR US2001-335165P/AP OR US2001-864384/AP
OR US2002-287935/AP OR US2002-307069/AP OR US20020177083/PN OR
US2003-421355/AP OR US20030142901/PN OR US2004-494122/AP OR
US2004-500425/AP OR US2004-555770P/AP OR US2004-900624/AP OR
US20040014186/PN OR US20040087177/PN OR US20040102050/PN OR
US2005-83739/AP OR US20050048570/PN OR US20050221081/PN OR
US20050227232/PN OR US2006-390405/AP OR US2006-477655/AP OR
US2006-594654/AP OR US20060021647/PN OR US20060263033/PN OR

11/594654

US2007-757018/AP OR US20070098899/PN OR US20070140901/PN OR
US20080182072/PN OR US6586158/PN OR US6756605/PN OR US6893966/P
N OR US7020355/PN OR US7381789/PN OR WO2001027972/PN OR
WO2002-US3885/AP OR WO2002095787/PN OR WO2003055590/PN OR
WO2003056336/PN OR WO2003076082/PN OR WO2003099465/PN OR
WO2005092516/PN)

L46 FILE 'HCAPLUS' ENTERED AT 15:22:08 ON 28 OCT 2009
16 SEA ABB=ON PLU=ON L32 NOT L45

FILE 'STNGUIDE' ENTERED AT 15:22:37 ON 28 OCT 2009
D QUE L40

FILE 'WPIX' ENTERED AT 15:23:27 ON 28 OCT 2009
D L40 1-14 IALL ABEQ TECH ABEX

FILE 'STNGUIDE' ENTERED AT 15:23:38 ON 28 OCT 2009
D QUE L46
D QUE L44

L47 FILE 'HCAPLUS, COMPENDEX, INSPEC, SCISEARCH, PASCAL' ENTERED AT 15:24:08
ON 28 OCT 2009
22 DUP REM L46 L44 (5 DUPLICATES REMOVED)
ANSWERS '1-16' FROM FILE HCAPLUS
ANSWER '17' FROM FILE COMPENDEX
ANSWERS '18-19' FROM FILE INSPEC
ANSWERS '20-22' FROM FILE SCISEARCH
D L47 1-16 IBIB ABS HITIND
D L47 17-22 IBIB AB IND